WILLIAM GRABE AND
FREDRICKA L. STOLLER

TEACHING AND RESEARCHING READING

Third Edition

Applied Linguistics in Action

ROUTLEDGE

Teaching and Researching Reading

Now in its third edition, *Teaching and Researching Reading* charts the field of reading (first and second language) systematically and coherently for the benefit of language teaching practitioners, students, and researchers. This volume provides background on how reading works and how reading differs for second language learners. The volume includes reading-curriculum principles, evidence-based teaching ideas, and a multi-step iterative process for conducting meaningful action research on reading-related topics. The volume outlines 14 projects for teacher adaptation and use, as well as numerous new and substantially expanded resource materials that can be used for both action research and classroom instruction.

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Applied Linguistics in Action

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Teaching and Researching Reading

Third Edition

William Grabe and Fredricka L. Stoller

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We'd like to dedicate this volume to our siblings:
Linda Hartmann and Dorothy Nolte
David L. Stoller and Marshall L. Stoller

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Series Editor Preface

Note from Routledge: *Christopher Candlin and David Hall were founding editors of the Applied Linguistics in Action series when Pearson Education Limited was the series' publisher. After David passed away in February 2014, Christopher continued as general editor of the series for Routledge until his passing in May 2015. To honor their invaluable work for and involvement in books that they commissioned for the series, we are retaining their original series preface for this volume.*

Applied Linguistics in Action, as its name suggests, is a series which focuses on the issues and challenges to teachers and researchers in a range of fields in Applied Linguistics and provides readers and users with the tools they need to carry out their own practice-related research.

The books in the series provide the reader with clear, up-to-date, accessible and authoritative accounts of their chosen field within applied linguistics. Starting from a map of the landscape of the field, each book provides information on its main ideas and concepts, competing issues, and unsolved questions. From there, readers can explore a range of practical applications of research into those issues and questions, and then take up the challenge of undertaking their own research, guided by the detailed and explicit research guides provided. Finally, each book has a section which provides a rich array of resources, information sources and further reading, as well as a key to the principal concepts of the field.

Questions the books in this innovative series ask are those familiar to all teachers and researchers, whether very experienced, or new to the fields of applied linguistics.

- What does research tell us, what doesn't it tell us, and what should it tell us about the field? How is the field mapped and landscaped? What is its geography?
- How has research been applied and what interesting research possibilities does practice raise? What are the issues we need to explore and explain?
- What are the key researchable topics that practitioners can undertake? How can the research be turned into practical action?
- Where are the important resources that teachers and researchers need? Who has the information? How can it be accessed?

Each book in the series has been carefully designed to be as accessible as possible, with built-in features to enable readers to find what they want quickly and to home in on the key issues and themes that concern them. The structure is to move from practice to theory and back to practice in a cycle of development of understanding of the field in question.

Each of the authors of books in the series is an acknowledged authority, able to bring broad knowledge and experience to engage teachers and researchers in following up their own ideas, working with them to build further on *their* own experience.

The 1st editions of books in this series have attracted widespread praise for their authorship, their design, and their content, and have been widely used to support practice and research. The success of the series, and the realization that it needs to stay relevant in a world where new research is being conducted and published at a rapid rate, have prompted the commissioning of this 3rd edition. This new edition has been thoroughly updated, with accounts of research that has appeared since the previous edition and with the addition of other relevant material. We trust that students, teachers, and researchers will continue to discover inspiration in these pages to underpin their own investigations.

Chris Candlin
David Hall

Authors' Acknowledgments

We would like to thank Routledge for the opportunity to update our thinking about L1 and L2 reading research, instruction, and action research in this 3rd volume. We would also like to thank Takako Huang and colleague Xiangying Jiang for their valuable feedback on various parts of the book. And, of course, we want to thank our MA TESL and PhD in applied linguistics students at Northern Arizona University who have helped us think through reading from various perspectives over the years.

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Introduction to the 3rd Edition

In this introduction to the 3rd edition of *Teaching and Researching Reading*, we begin by identifying the changes we have made in this edition, and we provide an overview of the volume and its five major sections. We then situate the contents of the book with introductory comments about contexts of L2 reading, connections between reading research and reading instruction, and first- and second-language reading abilities. Finally, we comment on reading-related action research.

Writing a 3rd Edition

We are pleased to have been given the opportunity to write this 3rd edition of *Teaching and Researching Reading*. In writing this new edition, we have thoroughly revised and updated the 2nd edition (much like we did from the 1st edition to the 2nd edition). The first two chapters still provide the theoretical foundation for a description of reading abilities, but we have completely updated research resources and made some significant changes to our descriptions of reading. We are happy to say, however, that our explanation of reading theory provided in this 3rd edition is essentially the same in broad strokes as that presented in the 2nd edition. (It is good to know that our view of reading, articulated in our 2nd edition ten years ago, continues to be firmly grounded in research in this 3rd edition.) Our views on the relationship between first language (L1) reading and second language (L2) reading also remain essentially the same, although the notion that L2 reading involves a dual-language system has been sharpened. Chapters 3 and 4 are completely new. Chapter 3 comprises a long research story and 10 new exemplary L1 reading research studies. Chapter 4 highlights exemplary L2 research studies, and all 10 studies are new to this 3rd edition. It is worth noting that we liked the studies presented in both the 1st and 2nd editions (and encourage readers to refer to them), but the last decade has brought to light many new research studies that have expanded our views on reading research and highlight important implications for instruction. We have listed the research studies reviewed in both the 1st and 2nd editions in Chapter 10. They continue to be remarkable stories.

Chapter 5 is new to this edition. It describes how we translate the research findings, and their implications, into a set of guiding curricular principles that

can organize, or enhance, reading instruction. In a sense, this chapter provides a blueprint for how to move from research to instructional applications by first considering and prioritizing a set of organizing curricular principles. Chapter 6 makes the transition from organizing ideas and learning goals to actual evidence-based teaching practices; the teaching ideas and resources presented in the chapter can be adopted and adapted by teachers to enhance their reading instruction. We have felt, for some time now, that a third edition of the book would be greatly enhanced by a curriculum chapter. The new Chapter 5 situates the specific teaching practices in Chapter 6 and provides rationales for engaging stufents in various reading and reading-related activities. In both Chapters 5 and 6, we have also given consideration to digital reading contexts and what they entail for students learning to read English for academic purposes.

Chapters 7–9 again introduce readers to action research and outline reading-related action-research projects that teachers can easily adapt for their own instructional contexts. Our many years of experience training teachers to engage in action research have helped us refine our depiction of the action research process in Chapter 7. Chapters 8 and 9 comprise numerous model action research projects, many of them new to this edition, that showcase the varied ways teachers can explore reading topics through action research. We remain firmly committed to the idea that teachers benefit from examining their own teaching practices and their own students' learning in order to become more effective reading teachers. The resources provided throughout (in the forms of charts, tables, sample materials, checklists, and so forth) are either new or updated for this edition. These resources can be used as guides for action research and, importantly, as additional teaching ideas adaptable for immediate use in the classroom, whether teachers are engaging in action research or not. We feel that our revisions have greatly strengthened these chapters, and we believe that teachers will profit from them in many ways. Finally, in Chapter 10, we have slimmed down some of the resources but retain the ones that we believe are essential.

The Contexts of L2 Reading

Ten years after the 2nd edition, we can report that approximately 89% of the world's population is reportedly able to read, even if only at a basic level. While numbers on such a large scale can be misleading, it is safe to say that the majority of humans are able to read in their first language at some basic level. An unknown percentage of these readers is also able to read, at varying ability levels, in one or more additional languages. The extent of basic literacy around the world should not be surprising because literacy (reading and writing, but here the focus is on reading) is seen as necessary (but not sufficient) for improving earning potential and quality of life. At the same time, a bit of reflection reveals that reading, and literacy more generally, provides no special entry to a better standard of living. All we know is that, without it, opportunities for improving one's life are limited. As we begin a new decade in the 21st century, productive and educated citizens will require even stronger literacy abilities (including both reading and writing)

in an increasingly broad range of societal settings. Likewise, the age of technology growth is likely to make greater, rather than lesser, demands on people's reading abilities.

The role of reading in society is quite complex, so a few comments are needed to situate the role of reading and student learning. A major goal for many educational institutions around the world is to promote literacy abilities, and we often hear of efforts to eliminate illiteracy altogether. Many of us take this perspective for granted and seldom consider critically the role of literacy in societies around the world. In fact, the universal-eradication view is somewhat simplistic. As much as we would like to believe that all societies value the same educational goals, some people do not need literacy to function well in their societal contexts. Others achieve societal success with relatively minimal levels of literacy. Finally, literacy itself is not a singular notion that operates uniformly in all societies. There are many types of literacy abilities (e.g., reading, writing, reading and writing together, interpreting documents, integrating visual representations with prose text, working with multiple texts), just as there are many types of reading abilities and ways of reading. However, having made these comments, it is nevertheless true that the large majority of individuals need literacy to further their goals and better their lives.

Within this larger context, reading in L2 settings continues to take on increasing importance. The overwhelming majority of societies and countries around the world are multilingual, and citizens are expected to function well in more than one language. L2 reading ability, particularly with English as the L2, is already in great demand as English continues to spread, not only as a global language but also as the language of science, technology, and advanced research. Many people in multilingual settings need to read in an L2 (and not only English as the L2) at reasonably high levels of proficiency to achieve personal, occupational, and professional goals. But reading proficiency in an L2 does not develop as completely or as "easily" as it apparently does in one's L1. Actually, the development of L1 reading also takes a considerable amount of time, and it is one of the primary goals of K–6 education. As adults, we often overlook the intense time and resource commitments made by educational systems to teach L1 reading. Seldom are L2 students given as much time to develop strong reading abilities, despite similarly demanding expectations for success.

We actually know relatively less about how people become good L2 readers, but we do know that there are significant differences between learning to read in L1 and L2 settings. It is also true that connections between research and reading instruction in L2 contexts are not well supported for a variety of reasons. In some cases, there are too many diverse types of L2 learners to generalize from the limited number of existing research studies that have been done well; in other cases, differing student L1s may limit general assertions from research; and, in yet other cases, great differences in L2 proficiency levels among student groups limit the generalizability of claims. Several of these issues in connecting research and teaching practice are explored throughout this volume.

Because there is not a single consensus view from L2 reading research of how best to help students become more skilled readers, a major goal of this volume is

to persuade teachers to carry out small-scale research projects on different aspects of reading that can strengthen the connection between research assertions and effective teaching practices. This building of linkages between research and teaching practices involves action research, a form of teacher-initiated inquiry in which teachers look systematically and critically at their own classrooms to get an insider's view of the teaching and learning process. By means of action research, we can learn about our own teaching practices and improve student learning. The outcomes of action research can also influence more formal research, making the information flow a two-way enterprise.

Reading Research and Reading Instruction

The ability to benefit from formal reading research studies, and to inform research in turn (via action research), requires that we have a grasp of the fundamental issues that motivate research into reading and its development. When we develop our conceptions of what is important in reading research, we tend to create mental images of the overall reading process (something like a conceptual map of the "terrain" of reading) into which we can incorporate new findings and assess the value of new claims. This sort of map is essential to understanding the competing assertions that are often made about reading and their implications for teaching. And it is such a map that we benefit from as we critically assess how students learn and how students can learn more effectively through instructional innovations. The knowledge associated with these mental maps of the reading research territory offers us ways to evaluate the assertions made by others who may be engaged in curriculum planning, course design, materials development, or adaptation projects. Thus, a second major goal of this volume is to help build a conceptual map of the reading research landscape and use this information for our own purposes.

The difficulty with building an effective conceptual map is that the field of reading has evolved remarkably in the past 35 years. (For an example, see the long research story in Chapter 3.) The ways that reading is now examined in L1 settings are quite different from the standard assumptions of 25 years ago and, for some practitioners, different even from their beliefs 5–10 years ago. So, we see this edition as filling a need to highlight the major issues and research findings of the past decade, mapping out the "territory" of reading as it is currently understood by reading researchers. To do so, we describe reading and reading instruction in ways that may not be entirely familiar to some applied linguists and L2 teachers, but there are strong arguments for these views of reading and reading instruction. These perspectives, we believe, will help develop more informed instruction, greater teacher awareness, more meaningful teacher inquiry, and more effective learning for L2 students.

A Preliminary Notion of Reading Abilities

Reading can be thought of as a way to draw information from a text and to form a coherent interpretation of that information. However, this "definition"

does not really tell us much about what happens when we read and how we comprehend a text. Actually, as the first chapter of the book shows, reading comprehension is remarkably complex, involving many processing skills that are coordinated in very efficient combinations. Because we also read for different purposes, there are many ways to read a text, further complicating any definition. Seen in this light, the ability to read is a remarkable type of expertise that most humans develop; it is not generally well understood, nor is its development widely recognized for the significant cognitive achievement that it is. We hope that readers of this volume develop a greater respect for the expertise required with any sustained effort at reading comprehension, because skilled reading surely is a type of cognitive expertise. We also hope to share our fascination with research efforts, and associated instructional practices, that help clarify the abilities involved in reading comprehension and their development over time.

One of the logical places to begin a discussion of reading is to define this ability as it is used by the fluent L1 reader (as we do in Chapter 1). One needs to understand *skilled* reading in order to explore how it is learned and what can be done to teach such abilities to learners. The same logic applies equally well whether the goal is to understand how a person learns to read in his or her L1, or L2 or, for that matter, L3. And while the path of development and the rate of progress may vary for different L2 readers, the end goal of highly skilled fluent reading looks quite similar for both L1 and L2 learners when advanced expertise emerges. At the same time, many research studies, as well as teaching and teacher-training resources, highlight the difficulties involved in describing the nature of reading abilities and how they are learned. These difficulties reveal the need for all of us to develop our own investigative practices in our classrooms. A principled set of ways to observe and analyze student learning will help us understand competing research claims and draw conclusions that will make us all more effective teachers.

A Closing Note on Action Research and Teaching

One of the primary goals of this book is to help teachers add basic research inquiry to their expertise as reading teachers. Good reading teachers are well informed and able to critically assess the claims made by others in journals, teacher-reference materials, and conference presentations. In particular, teachers can "test" these claims through systematic observation, data collection, data analysis, and critical reflection using their own classrooms and students to understand learning processes and teaching practices better. Guided inquiry of this type may not lead to major research breakthroughs, but it will certainly lead to a heightened awareness of teaching and learning practices in L2 reading classrooms. Moreover, in light of both a strong research foundation and personal experiences with classroom inquiry, teachers will be better equipped to evaluate and critique materials, curricular innovations, and new teaching practices. Another goal of the volume is to introduce teachers to evidence-based teaching practices

that they can easily adapt and integrate into their reading lessons, the materials that they develop for their classes, and the reading-related tasks that they devise for their students and their overall reading curricula. The final outcome, we hope, will be more confident teachers, better-informed instruction, and more skilled student readers.

Pleasant reading!

Part I
Understanding L2 Reading

Quote

> Reading comprehension is widely agreed to be not one, but many things. [At a minimum, it entails] cognitive processes that operate on many different kinds of knowledge to achieve many different kinds of reading tasks. Emerging from the apparent complexity, however, is a central idea: comprehension occurs as a reader builds one or more mental representations of a text message. … Among these representations, an accurate model of the situation described by the text … is the product of successful deep comprehension.
>
> Perfetti and Adlof (2012, p. 3)

Quote

> In any domain that one can identify—whether it be medical diagnosis, flying an aircraft, or programming computers—it would be absurd to think that someone becomes proficient without participating extensively in the activity. … When it comes to teaching students to read in schools, however, little attention is paid to the amount that students read texts.
>
> Hiebert and Martin (2009, pp. 3–4)

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1 The Nature of Reading Abilities

This chapter sketches out an exploratory map of reading by providing the following:

- A description of the miracle of reading (Part I).
- An initial definition of reading.
- A discussion of purposes for reading.
- A definition of fluent reading comprehension.
- An explanation of how reading works.
  - Lower-level processing.
  - Higher-level processing.
  - Cognitive and neurolinguistic processing.
- A description of the miracle of reading (Part II).
- An introduction to frequently cited models of reading.

1.1 A Description of the Miracle of Reading (Part I)

This volume starts off from a somewhat unusual vantage point, but it is one that should be quite persuasive by the end of the chapter. Stated simply, the ability to read fluently is extraordinary; in fact, it is miraculous. Reading silently and individually became possible only about 500 years ago for a large number of people in Europe (Manguel, 1996; Pearson & Hamm, 2005). More broadly, it is only in the past 100 years or so that school expectations for many students included abilities to read a fairly large amount of text materials for content learning purposes (Pearson & Goodin, 2010). The recency of what we know as fluent reading for comprehension can mean only that reading for comprehension is an ability that is culturally transmitted from one generation to the next.

Humans are not biologically predisposed to become readers (Andrews, 2015; Perfetti & Stafura, 2014; Seidenberg, 2017). We do, however, learn to speak and listen to a language variety, no matter who the learner is, assuming normal environmental support and normal cognitive development in early childhood. We can say that humans are hard-wired to learn to speak a language variety. But reading comprehension abilities are not natural because they are not a part of automatic human maturation processes; instead, skilled reading must be taught

by some person or persons because our brains are not designed naturally to be reading brains. We know this to be true at a basic level because approximately 14% of all humans aged 25–64 (690 million people) are not considered to be literate.[1] These non-literate humans are not somehow unnatural; rather, they just have not been taught to read.

Quote 1.1

> Recent worldwide census data show … that the adult literacy rate has increased from 83% in 1990 to 89% in 2012. In the population aged 15–24, 87% of females and 92% of males now have basic reading skills. Despite these gains, more than 700 million adults throughout the world are still unable to read, with almost two-thirds being female (United Nations, 2014).
>
> Verhoeven and Perfetti (2017b, p. 2)

Over the past 20 years, additional evidence has shown that reading is a culturally learned ability. As readers, we all learn to take visible graphic forms on a page and mentally interpret them into our own language, no matter what language we speak. We now know that part of the brain (the occipital cortex, at the back of the brain, that is used for visual form recognition) develops specific pathways for automatic word recognition that are not genetically hard-wired in human brains but must be learned (Dehaene, 2009; Seidenberg, 2017). Because the brain is flexible and can incorporate new uses into specific brain regions, we are able to expand the brain region for visual form recognition and facial recognition to also become a region for visual *word* form recognition (Schwanenflugel & Knapp, 2016; Ullman, 2015). This word form recognition region also begins a brain pathway through the lower temporal cortex region that allows for direct word recognition processes (e.g., sight word reading, from word form directly to word meaning, generating the phonological form at the same time).

Quote 1.2

> Reusing structures to solve new problems occurs not only evolutionarily, but also developmentally, as we grow up. For example, reading seems to depend on previously existing brain circuitry that is coopted for this function as we learn to read.
>
> Ullman (2015, p. 135)

As fluent readers, we engage in automatic word recognition without having to think about it, and we do it at a rate that is even faster than our fluent listening abilities. And we do this increasingly, as we read, to add more and more vocabulary words to our lexicon, including those that are not part of our speaking vocabulary (Seidenberg, 2017). We also then connect this very fast processing

to comprehension skills (as explained below) for understanding information in texts (and using the resulting information for various academic and professional purposes). So, what is it that we do when we read, and how do we do this?

1.2 An Initial Definition of Reading

A common way to begin a discussion of reading is to provide a definition of the concept. However, this approach, while important for clarifying later discussions, is not so easy. We noted in the introduction that it is possible to present a single-sentence definition of reading such as the following: Reading is the ability to draw meaning from the printed page and interpret this information coherently, one of many possible variants. However, without quibbling over the exact wording of such a definition, it is nonetheless insufficient as a way to understand the true nature of reading abilities. There are four important reasons why this simple definition is inadequate:

- First, it does not convey the idea that there are a number of ways to engage in reading. A reader has several possible purposes for reading, and each purpose emphasizes a somewhat different combination of skills and strategies.
- Second, it does not emphasize the many criteria that define the nature of fluent reading abilities; it does not reveal the many skills, processes, and knowledge bases that act in combination, and often in parallel, to create the overall reading comprehension abilities that we commonly think of as reading.
- Third, it does not explain how reading is carried out as a cognitive process that operates under intense time constraints, yet these very rapid time-processing constraints are essential to understanding how reading comprehension works for the fluent reader.
- Fourth, it does not address the social context in which reading takes place or the reasons why texts will be interpreted and used in differing ways.

These four issues are addressed in this chapter as a way to describe the nature of fluent reading abilities. The chapter closes with brief comments on certain influential models of reading—models that try to synthesize what we know about reading (or some subset of reading abilities) and account for reading performance and reading development.

We would like to point out, at this time, that this chapter focuses primarily on the fluent first language (L1) reading process. One might ask why a book on L2 reading begins with a discussion of the fluent L1 reading process; there are a number of good reasons for adopting this approach. First, far more research has been carried out on reading in L1 contexts (especially in English as an L1; cf. Verhoeven & Perfetti, 2017a) than in L2 contexts. Second, students learning to become readers in L1 contexts usually achieve a reasonable level of reading fluency, usually by 5th grade in English (and earlier in several other alphabetic

languages), but the same claim cannot be made for students learning to read in L2 contexts. Third, the ability to draw implications for instruction from research—including training studies that demonstrate the effectiveness of numerous instructional techniques and practices—is much more developed in L1 contexts than it is in L2 contexts. These factors suggest that we have become increasingly better at describing the reading abilities of students learning to read in their L1s. Even if many L2 students will never become fluent L2 readers, they can be taught in ways that lead them in the right direction and help them make as much progress as possible. This direction toward a successful end-point is what L1 reading research can offer us.

Our position on the value of L1 reading research is not meant to suggest that we ignore the significant differences between L1 and L2 reading contexts; in fact, these differences are addressed in Chapter 2. It is also the case that L2 reading research has expanded considerably in the past decade, so there is much new territory to discuss. However, at very advanced levels, it is still true that L1 and L2 reading abilities tend to merge and appear to be quite similar (Dronjic & Bitan, 2016; Verhoeven, 2017). So, to understand the endpoint of reading abilities, that of the fluent critical reader, research on L1 reading development offers us a much more complete understanding.

1.3 Purposes for Reading

Quote 1.3

> Strategic readers begin with a purpose for reading and recognize that different goals require different types of reading.
>
> Schwanenflugel and Knapp (2016, p. 219)

When we begin to read, we actually have a number of initial decisions to make, among them why we are reading and for what purpose (or purposes) (Britt, Rouet, & Durik, 2018; Schwanenflugel & Knapp, 2016; van den Broek & Kendeou, 2017). We usually make these decisions very quickly and, in most cases, unconsciously. For example, when we pick up a newspaper, we usually read the front page with some combination of search processing, general reading comprehension, and skimming. We may initially search the front page for a particular story that we expect to be there. If the headlines cue us in the right way, we may check quickly for the length of the article, and we may then read through a number of paragraphs for comprehension (appropriately influenced by the newspaper-story genre, a reporting of what, who, when, where, why, and how). At some point, we decide that we have enough information and either stop reading the article or skim the remainder to be sure that we do not miss some surprisingly informative part.

Alternatively, for many of us, we might pick up our cell phone, laptop, or tablet to look at news electronically or to check social sites. With the newspaper, we read partly for information, but we also read with a goal to finish the newspaper fairly rapidly. When we look online at social media platforms, we are maintaining social networks. We might move very quickly across media outlets to see who is out there and what they are saying. Our purpose is to stay connected. In other settings, typically academic or professional ones, we sometimes synthesize information from multiple reading sources, from both online and print sources, from different parts of a long and complex text, or from a prose text and accompanying diagram or chart.

Quote 1.4

> A comprehensive theory of reading should account for the flexibility of reading behaviors as a function of the readers' goals and purposes … Researchers recognized early on that people read for many reasons and began investigating how people adapt their reading for these goals … Researchers found that instructions to read for a more general or more specific purpose produced differences in the way people read and what information they acquired.
>
> Britt, Rouet, and Durik (2018, pp. 22, 23, 25)

Finally, and most commonly in L1 settings, people read for general comprehension (whether for information or for pleasure). Here we might read a novel, a short story, a newspaper article, or a report of some type to understand the information in the text, to be entertained, or to use the information for a particular purpose. The overall goal is not to remember most of the specific details but to have a good grasp of the main ideas and supporting ideas, and to relate those main ideas to **background knowledge**[2] as appropriate.

Quote 1.5

> In the context of reading comprehension, several forms of prior (or background) knowledge are particularly relevant: domain knowledge about the specific field or area of the discourse (e.g., science, medieval history); topic knowledge relevant to the content of a particular discourse; general world knowledge that captures information assumed to be known by the general population; vocabulary knowledge about the meanings of words … ; and genre knowledge about the specific purposes, structures, and audiences of different texts.
>
> van den Broek and Kendeou (2017, p. 286)

We believe that common reading purposes can be classified under seven general headings (see Concept 1.1) while recognizing that these headings are heuristic

and many variations could be proposed (e.g., Alderson et al., 2015). Each purpose for reading is explained further in the upcoming sections of the chapter.

Concept 1.1: Purposes for Reading

1. Reading to search for simple information
2. Reading to skim quickly
3. Reading to learn from texts
4. Reading to integrate information
5. Reading to write (or search for information needed for writing)
6. Reading to critique texts
7. Reading for general comprehension

1.3.1 Reading to Search for Simple Information and Reading to Skim

Reading to search for simple information is a common reading ability, though some researchers see it as a relatively independent cognitive process (Guthrie & Kirsch, 1987). It is used so often in reading, and especially in digital reading, that it needs to be classified as a type of reading ability. In reading to search, we typically **scan** the text or a digital screen for a specific word, a specific piece of information, or a few representative phrases. As an example, we usually search through a Google results page to find key information, either in a title or a source header. In prose texts, we sometimes slow down to process the meaning of a sentence or a phrase in search of clues to indicate that we are at the right page, section, or chapter. Similarly, reading to **skim** (i.e., sampling segments of the text for a general understanding) is a common part of many reading tasks and a useful skill in its own right. It involves, in essence, a combination of strategies for guessing where important information might be located in the text and then using basic reading comprehension skills (and background knowledge) on those text segments until a general idea is formed.

1.3.2 Reading to Learn from Texts

Reading to learn typically occurs in academic and professional contexts in which a person needs to learn a considerable amount of information from a text. Often there is an assigned task that directs the reader's goals. It requires abilities to

- Remember main ideas as well as details that elaborate the main and supporting ideas in the text
- Recognize or build relevant **rhetorical frames** that organize the information in the text (e.g., problem–solution, cause–effect)
- Link the text strongly to the reader's knowledge base
- Take a learner's stance or a critical evaluative stance

Reading to learn is usually carried out at a reading rate somewhat slower than general reading comprehension. In addition, it makes stronger **inferencing** demands than general comprehension to connect text information with background knowledge (e.g., connecting a character, event, or concept to other known characters, events, or concepts; or connecting possible causes to known events). It also requires enhanced **comprehension monitoring** skills.

1.3.3 Reading to Integrate Information, Write, and Critique Texts

Reading to integrate information requires additional decisions about the relative importance of complementary, mutually supporting, or conflicting information and the likely restructuring of a rhetorical frame to accommodate information from multiple sources. In these circumstances, a more critical set of goals must be established for an effective synthesis: the reader needs to remember points of comparison or opposition, assess the relative importance of the information, construct a framework in which the information will be organized, and establish the main theme(s). These skills inevitably require critical evaluation of the information being read so that the reader can decide what information to integrate and how to integrate it for the reader's goal. In this respect, both *reading to write* and *reading to critique texts* may be task variants of reading to integrate information. Both require abilities to select, critique, and compose information from a text. The increasing uses of digital media for information greatly expand the importance of these specific abilities (and others). Both of the latter purposes also represent common academic and professional tasks that call upon the reading abilities needed to integrate information (see Enright, Grabe, Koda, Mosenthal, & Mulcahy-Ernt, 2000; Perfetti, Rouet, & Britt, 1999; van den Broek & Kendeou, 2017).

1.3.4 Reading for General Comprehension

The notion of general reading comprehension has been intentionally saved for last in this discussion for two reasons. First, it is the most basic purpose for reading, underlying and supporting most other purposes for reading. Second, general reading comprehension is actually more complex than commonly assumed. (Note that the term *general* does not mean "simple" or "easy.") These assertions are treated in detail in the next two sections of this chapter. Reading for general comprehension, when accomplished by a skilled fluent reader, requires very rapid and automatic processing of words, strong skills in forming a general meaning representation of main ideas, and efficient coordination of many processes under very limited time constraints.

These abilities are often taken for granted by fluent readers because they usually occur automatically; that is, we make use of these abilities without giving them much thought if we are fluent readers. In L2 contexts, however, the difficulties that students have in becoming fluent readers of longer texts under time constraints reveal the complexities of reading for general comprehension. Because

of its demands for processing efficiency, reading for general understanding may, at times, even be more difficult to master than reading to learn, an ability that is often assumed to be a more difficult extension of general comprehension abilities. (This misperception is most likely due to the ways in which reading comprehension and reading to learn are commonly tested in schools.)

Before defining fluent reading in more detail, we would like to comment on two terms commonly used to describe the activity of reading: **skills** and **strategies**. For us, *skills* represent linguistic processing abilities that are relatively automatic in their use and their combinations (e.g., word recognition, lexical access, syntactic processing). In most educational psychology discussions of skills, they are seen as general learning outcomes of goal-driven tasks, acquired gradually and eventually automatized (Afflerbach, Pearson, & Paris, 2008; Alexander & Jetton, 2000; Anderson, 2015; Proctor & Dutta, 1995; Schunk, 2000). *Strategies* are often defined as a set of abilities under potentially conscious control of the reader, though this common definition is not likely to be entirely true (Anderson, 2009). In fact, many abilities that are commonly identified as strategies are relatively automatic in their use by fluent readers (e.g., skipping an unknown word while reading, re-reading to reestablish text meaning, mentally summarizing a newspaper story quickly to tell a friend) (van den Broek & Kendeou, 2017). Thus, the distinction between skills and strategies is not entirely clear precisely because of the very nature of reading, not because of a definitional problem (cf. Anderson, 2009). Nonetheless, the strategies concept is important when considering reading abilities. Reading strategies are most evident and important when readers look for ways to address a problem or a specific goal while reading (usually with more advanced and more challenging texts).

Quote 1.6

> During the 1970s, when it first dotted the reading landscape, the term *strategies* signified a form of mental processing that deviated from traditional skills-based reading. However, any distinctions between skills and strategies that seemed apparent then have begun to fade, leaving many to wonder where skills end and strategies begin. As a way to unearth those contrasts, we propose two differences between skillful and strategic processing relevant to text-based learning: automaticity and intentionality…. Skills are, in essence, essential academic habits. They are the routinized, automatic procedures we employ when we engage in any nontrivial task. Thus, skilled readers, like skilled cooks or skilled accountants, have honed essential domain procedures to a level of automaticity….
>
> The same procedures (e.g., identifying main ideas) can fit under both the skill and strategy categories. The appropriate label rests on whether the reader consciously evokes the procedure or is simply functioning in a typical, automatic way.
>
> Alexander and Jetton (2000, pp. 295–296)

Quote 1.7

> Paris and his colleagues (Paris, Wasik, & Turner, 1991) described reading strategies as "skills under consideration" to denote that the same actions could be either a skill or a strategy, depending on the reader's awareness, control, intention, and the specific reading situation.
>
> Afflerbach, Pearson, and Paris (2008, p. 17)

Some example strategies include previewing a text, posing questions about the text, connecting text to background knowledge, summarizing, making inferences, and re-reading. In Appendix 5-B, we list a more comprehensive set of the most commonly noted strategies seen as important for reading comprehension. Many have been validated by research studies, either directly or indirectly (as part of a set of strategies in a training program; see Anderson, 2009; Cho & Afflerbach, 2017). To be complete with terminology, the term **reading processes** here refers to cognitive activity involving skills, strategies, attentional resources, knowledge resources, and their integration. The term *abilities* is used here as a general term that covers comprehension skills, strategies, and knowledge resources available to the reader.

1.4 Defining Fluent Reading Comprehension

Reading for general comprehension is, in its most obvious sense, the ability to understand and interpret information from a text appropriately. However, comprehension abilities are much more complex than this definition suggests. To offer a more accurate picture of reading comprehension, we first define it according to a set of necessary general processes (Concept 1.2). No one process defines reading comprehension by itself, but together these processes provide a fairly accurate account of the processes required for fluent reading (see Grabe, 2009; Stafura & Perfetti, 2017b).

Concept 1.2: Processes Involved in Fluent Reading Comprehension

Fluent reading is:

1. a rapid process
2. an efficient process
3. an interactive process
4. a strategic process
5. a flexible process
6. an evaluating process
7. a purposeful process
8. a comprehending process
9. a learning process
10. a linguistic process

Fluent reading must occur *rapidly* in almost any purposeful context, and the more rapidly a text is (successfully) read the better the various processing

components are likely to operate. Thus, a good L1 reader reads most texts at rates somewhere between 240 and 300 words per minute, depending on reading purpose. Related to rate is the notion that specific processes must be carried out *efficiently* in combination if comprehension is to take place. That is, the various processes involved in comprehension must be coordinated, and certain processes need to be carried out automatically (Breznitz, 2006; Segalowitz, 2010; Verhoeven & Perfetti, 2017b).

Quote 1.8

> Highly fluent word reading is an effortless perceptual response that can include the automatization of word decoding, familiarity-based memory retrieval, and the attainment of fluent skilled reading. Moreover, these developments allow cognitive resources to be redirected to comprehension.
>
> Verhoven and Perfetti (2017b, p. 18)

Reading is also an *interactive* process in at least two ways. First, the various processes involved in reading are carried out virtually simultaneously. While we are recognizing words very rapidly and keeping them active in our **working memories** (Baddeley, 2015; Baddeley, Eysenck, & Anderson, 2015), we are also analyzing the structure of sentences to assemble the most logical clause-level meaning units, building a main-idea model of text comprehension in our heads, monitoring our comprehension, and so on. Combining these skills in an efficient manner makes general comprehension a time-consuming ability to master (Stafura & Perfetti, 2017). Reading is also interactive in the sense that linguistic information from the text interacts with information activated by the reader from **long-term memory**, as background knowledge. These two knowledge sources (linguistic and background) are essential for building the reader's interpretation of the text (see Concept 1.3).

Concept 1.3: What Is Working Memory? What Is Long-Term Memory?

The term *working memory* is now generally preferred to *short-term memory*. Working memory refers to the information that is activated, or given mental stimulation, for immediate storage *and* processing. Working memory for reading involves the active use of cognitive processes such as recognizing and storing word information, using syntactic information, connecting pronoun references, building overall text structure, integrating and restructuring information, establishing main ideas, assessing inferences, and adapting reader goals. In Baddeley's (2015) version, working memory is composed of a central executive processor and three sub-components: the visual-spatial sketchpad, the episodic buffer, and the phonological loop. Cowan (2015)

provides an interesting alternative version of working memory that is more aligned with neurolinguistic processing and less with sub-components of processing, but not so different in other respects. Other interpretations of working memory have also been proposed but go beyond the scope of this introduction.

The term *long-term memory* is the more technical term for *background knowledge*. All of the knowledge we have of the world, of our experiences, of our learning in specific disciplines, of our lexicon, of our tacit (implicit) knowledge, and of our internalized procedures and habits we have in navigating our world are aspects of long-term memory (Cowan, 2015; Eysenck & Keane, 2015; Kendeou & O'Brien, 2016).

Balancing the many skills needed for comprehension also requires that the reader be *strategic*. The reader needs to recognize processing difficulties, address imbalances between text information and reader knowledge, and make decisions for monitoring comprehension and shifting goals for reading (Almasi & Fullerton, 2012; Pressley, 2006). Being a strategic reader means being able to read *flexibly* in line with changing purposes and the ongoing monitoring of comprehension. Similarly, reading is an *evaluating* process in that the reader must decide if the information being read is coherent, is reliable, and matches the purpose for reading. This evaluation also extends to the reader's motivations for reading, the reader's attitudes toward the text and topic, the reader's feelings of likely success or failure with text comprehension, and the reader's expectation that the information from the text will be useful (or interesting, or enjoyable) (Guthrie & Taboada Barber, 2019; Schwanenflugel & Knapp, 2016).

Reading is always *purposeful* in the sense not only that readers read in different ways based on differing reading purposes but also that any motivation to read a given text is triggered by some individual purpose or task, whether imposed internally or externally. Reading is also a *comprehending* process. The notion of comprehending is both obvious and subtle. It is obvious in that any person could say that understanding a text is the purpose for reading; it is less obvious with respect to the ways that such understanding might be carried out by the reader, as is discussed in the next section. One outcome of reading being a purposeful and comprehending process is that it is also a *learning* process. This aspect of reading should be evident to anyone who works in academic settings where the most common way for students to learn new information is through reading.

Lastly, reading is fundamentally a *linguistic* process (rather than a reasoning process, a common perspective in the 1980s and 1990s), though this aspect of reading is still sometimes downplayed (as is the visual/orthographic aspect). It makes little sense to discuss or interpret text without engaging with it linguistically.

For example, anyone who has tried to read a text on political policy written in Chinese (without knowing any Chinese characters) or in Finnish (without knowing Finnish, even though the writing script is similar) will quickly recognize the primacy of linguistic processes for reading comprehension. If we cannot understand any words, we are not going to comprehend the text.

1.5 Describing How Reading Works: Components of Reading Abilities

To this point, we hope to have persuaded readers that reading comprehension abilities are quite complex and that they vary in numerous ways depending on tasks, motivations, goals, and language abilities. One might even get the impression that large differences exist among the various ways of reading. However, a set of common reading comprehension processes are activated as we read. In this section, we outline the ways that reading comprehension processes are likely to work for skilled readers, assuming a purpose of general comprehension of a longer text (like when we read a book at night before going to bed). (See Grabe, 2009; Seidenberg, 2017; Stafura & Perfetti, 2017; Willingham, 2017 for detailed descriptions of skilled reading processes.) For the sake of simplicity, we have divided this explanation of skilled reading into three parts: lower-level processes, higher-level processes, and **underlying general cognitive processes**. The first two sets of processes are common metaphorical designations that are explained in the sections that follow. Lower-level processes represent the more automatic linguistic processes and are typically viewed as more skills orientated. Higher-level processes generally represent comprehension processes that make much more use of the reader's background knowledge and inferencing abilities.

General cognitive processes (and knowledge storage resources) are those genetically wired abilities for mental processing of all types, and most can be viewed as parts of humans' more primal survival mechanisms. In fact, cognitive abilities underlie the development of all learning, including fluent reading. These underlying cognitive abilities are consistently used across all languages during reading and reading development. (Concept 1.4 provides an extensive, but likely partial, listing.) Some of these cognitive processes and resources are well known to impact reading comprehension abilities, such as working memory and background knowledge (or long-term memory). Some are often described as reading strategies even though they are larger cognitive skills also used for many non-reading purposes (inferencing, comprehension monitoring). Some are less commonly discussed but are essential cognitive skills for thinking, reasoning, and language use (e.g., inhibitory control, speed of processing, self-regulation, selective attention and attention shifting, cognitive flexibility, goal setting, consolidation). One outcome of these many processes is a system of **implicit learning**, which will draw centrally on some combination of **statistical learning**, **associative learning**, and **chunking** abilities. All of these abilities are key component

processes for information retrieval from long-term memory and linguistic comprehension processes (see Ellis, 2015; Eysenck & Keane, 2015; Seidenberg, 2017; van den Broek, Mouw, & Krall, 2016; Westby, 2014).

Concept 1.4: Underlying General Cognitive Processing Abilities

- Associative learning
- Cognitive flexibility
- Cognitive monitoring
- Consolidation and re-consolidation (learning)
- Drive for coherence
- Implicit learning (as a general category of learning)
- Inferencing
- Inhibitory control
- Long-term memory
- Motivational drive
- Pattern recognition and chunking
- Phonological awareness
- Processing speed
- Selective attention and attention shifting
- Self-regulation
- Statistical probability processing
- Timing integration of multiple processes
- Working memory

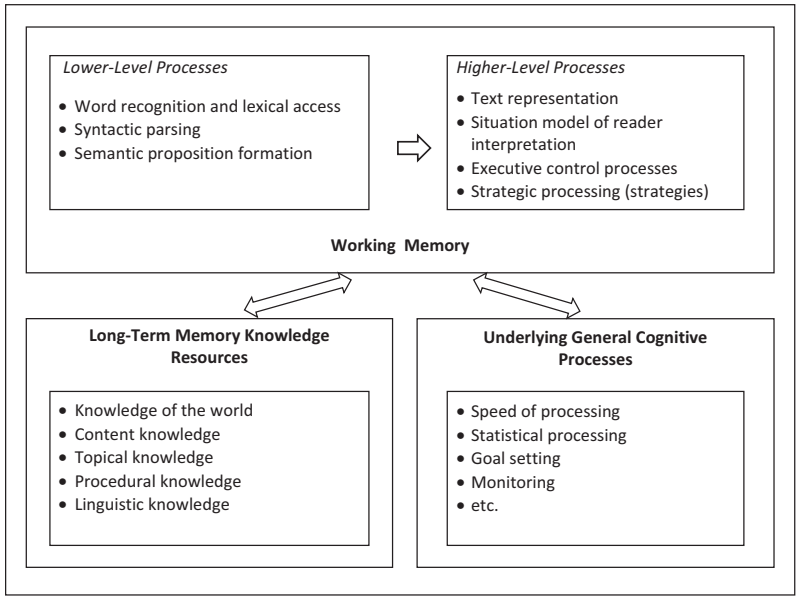
The processes listed in Concept 1.4 reflect underlying abilities that are critical for all types of interactions with the outside world as well as internal learning and regulatory processes. These concepts, in some combinations, have been sources of discussion for decades, but they are becoming more prominent as targets of reading research. Some component abilities may be overlapping or sub-systems of other underlying abilities. This area of reading research is evolving rapidly. The key idea is that we all have multiple cognitive systems that are not specific to reading processes, but they all play roles in the development of reading comprehension abilities.

Quote 1.9

> Learners induce the rules (and processes) of their L2 from the input by employing cognitive mechanisms that are not exclusive to language learning, but that are general cognitive mechanisms at work in any kind of learning, including language learning.
>
> Ellis (2015, p. 75)

In Concept 1.5, we sketch out the relationships among cognitive processing elements that support reading comprehension. These elements include lower-level processing, some **word-to-text integration** mechanism, higher-level processing, background knowledge and memory resources, and general cognitive processes that support reading comprehension. We would also like to note that lexical access (vocabulary knowledge) can be seen as one subset of world knowledge and long-term memory. While we have much knowledge that is not verbal in nature, our verbal knowledge is reflected in our lexical knowledge and our syntactic knowledge.

Concept 1.5: Relationships among Cognitive Processes That Support Reading Comprehension



1.5.1 Lower-Level Processes

The most fundamental requirement for fluent reading comprehension is rapid and automatic word recognition (or **lexical access**—the calling up of the meaning of a word as it is recognized). Lexical access assumes the activation of basic linguistic word recognition component abilities: **phonological awareness**, **orthographic knowledge**, **letter–sound correspondences**, and meaning activation (Schwanenflugel & Knapp, 2016; Willingham, 2017). The usual outcome of word recognition processing is lexical access. For fluent L1 readers, this means recognizing almost all of the words they encounter (99–100% of all words in a text), at least at some basic meaning level. Fluent L1 readers also recognize four to five words per second, about 240 milliseconds per word on average (Dronjic & Bitan, 2016; Pressley, 2006; Rayner, Pollatsek, Ashby, & Clifton, 2012).

Quote 1.10

> The average fixation lasts between 200 and 250 milliseconds …, with quite a bit of variability, ranging anywhere from 100 to over 450 milliseconds. Most of the duration of

> the fixation is not spent on visual processing, but rather on linguistic and conceptual processing.
>
> Dronjic and Bitan (2016, p. 38)

> Individuals automatically access phonology when they read and this is done within the first 30 ms of encountering the written word, Recent ERP work (Event Related Potential, a brain wave measure while reading) also provides support for early access of phonology within the first 80 ms of processing.
>
> Landi (2013, p. 16)

> If readers are allowed to see the fixated word for 50–60 ms before it disappears, they read quite normally …. The findings do not mean that readers are able to fully process and identify the fixated word in 50 to 60 ms, but rather that 50 to 60 ms is the time that is needed to get visual information into the processing system.
>
> Schotter and Rayner (2015, p. 53)

As amazing as it may seem, fluent readers can actually focus on a word and recognize it in less than a tenth of a second (less than 100 milliseconds). Thus, four to five words per second even allows good readers time for other processing operations. For fluent readers, lexical access is automatic. In addition to being very fast, it cannot be readily reflected on consciously, and it cannot be suppressed (a good definition of **automaticity**); that is, when the eye sees a word, the reader cannot stop himself or herself from accessing its meaning. Both rapid processing and automaticity in word recognition (for a large number of words) typically require thousands of hours of reading practice.

Quote 1.11

> Why does automaticity matter? … Decoding and comprehension compete for the available short-term [memory] capacity. When a reader slowly analyzes a word into component sounds and blends them, a great deal of capacity is consumed, with relatively little left over for comprehension of the word, let alone understanding the overall meaning of the sentence containing the word and the paragraph containing the sentence. In contrast, automatic word recognition (i.e. recognizing a word as a sight word) consumes very little capacity, and thus, frees short-term capacity for the task of comprehending the word and integrating the meaning of the word with the overall meaning of the sentence, paragraph, and text.
>
> Pressley (2006, p. 68)

Many L1 researchers focus a lot of attention on word recognition abilities. They explore these aspects of reading not because they believe that word recognition *is* reading comprehension but because reading comprehension cannot be carried out for an extended period of time without good word recognition

skills (Perfetti, Landi, & Oakhill, 2005; Stanovich, 2000). However, these skills are difficult to develop without **exposure to print** (through many hours of reading practice). In both L1 and L2 reading contexts, relatively little discussion is devoted to need for extensive exposure to print (cf. Ellis, 2015; Eskey, 1988; Grabe & Stoller, 2018; Hiebert, 2009; Oakhill & Cain, 2017; Seidenberg, 2017). This general avoidance is partly due to a limited understanding of the role of rapid and automatic word recognition processes in reading as well as the centrality of implicit learning for fluent reading skills. It is also due to the tremendous difficulties involved in providing L2 students with the time, resources, and practice needed to develop a very large recognition vocabulary. Nonetheless, fluent word recognition abilities cannot be ignored in L2 contexts if a goal is to help students become fluent L2 readers.

In addition to efficient word recognition, a fluent reader is able to take in and store words together so that basic grammatical information can be extracted (a process known as **syntactic parsing**) to support clause-level meaning. The ability to recognize phrasal groupings, word ordering information, grammatical categories of words, and subordinate and superordinate relations among clauses quickly is what allows fluent readers to clarify how words are supposed to be understood. (For example, the word "book," as in "the book fell," is recognized as a noun rather than the verb "to book," as in a police station. In the first case, "book" is also recognized as the clause subject that will be described and as an inanimate object that is followed by an "event" description, "fell.") Syntactic parsing helps to disambiguate the meanings of words that have multiple meanings out of context (e.g., bank, cut, drop). Moreover, it helps a reader determine what pronouns and definite articles are referring to in prior text (Grabe, 2009).

Strong evidence exists for the importance of syntactic parsing in reading comprehension. In L1 settings, Klauda and Guthrie (2008) found that syntactic processing correlated most strongly with reading comprehension among six **component skills** measured (r = .75) with 278 5th graders (see also Brimo, Apel, & Fountain, 2017; Deacon & Kieffer, 2018). In L2 settings, Alderson (1993) observed remarkably high correlations between syntactic knowledge and reading comprehension (r = .80), as did van Gelderen et al. (2004) (r = .80). There is also persuasive observational evidence for the strong relationship between grammar and reading for L2 learners (Urquhart & Weir, 1998).

Quote 1.12

To claim … that syntactic processing [or syntactic parsing] is not necessary is frankly unbelievable. This is easily demonstrated. The following string represents an English sentence from which most (not all) function words and all inflectional morphemes have been deleted. Moreover, since ordering plays a major part in English syntax, the order of the remaining words has been jumbled.

begin several it recogniser module machine digital pass record speech

We challenge anyone, whether expert in the content area (artificial language) or not, to process this string. Things begin to be a bit better if we restore the original ordering:

Machine begin digital record speech pass it several recogniser module

However, it is only when we restore function words and inflections that the message becomes easy to extract:

The machine begins by digitally recording the speech and passing it to several recogniser modules.
Urquhart and Weir (1998, pp. 60–61)

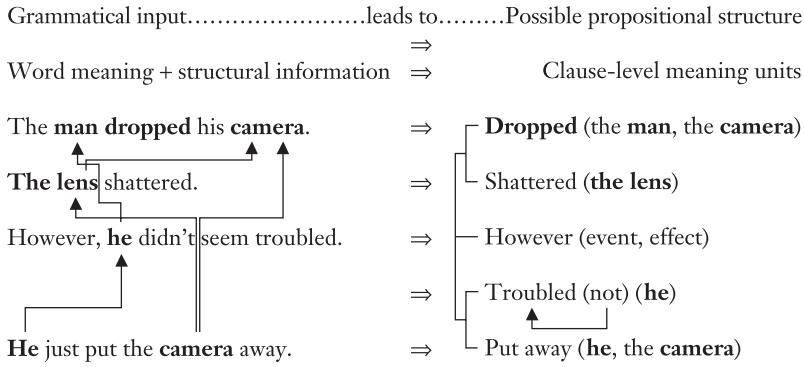
Perhaps most importantly, for fluent readers **parsing** is done very rapidly without much effort or conscious attention (unless something does not work right, and then the process becomes less automatic). So once again, rapid and automatic processing—at the level of initial syntactic parsing—is a necessary ability. The subconscious automaticity of syntactic parsing processes should be obvious to anyone who has taught high school or undergraduate university students in U.S. L1 settings; many L1 students can read fluently, but, in many cases, they have difficulty completing a grammar exercise at a conscious level (very prevalent in the U.S.). So, these L1 students "know" grammar tacitly (implicitly) but not explicitly. This example shows that we can have automatic processing without having overt metalinguistic knowledge of grammar. In L2 settings, the need for rapid and automatic syntactic processing appears to be less obvious because most L2 students develop an overt knowledge of L2 grammatical structures before they become fluent L2 readers. With L2 students, what is often overlooked is not the fact that L2 students need grammar knowledge to be readers but rather that, like developing L1 readers, they need countless hours of exposure to print (that they are capable of comprehending successfully) if they are to develop automaticity in using information from grammatical structures to assist them in reading.

A third basic process that starts up automatically almost at the same time as syntactic parsing as we begin any reading task is the process of combining word meanings and structural information into basic clause-level meaning units (**semantic proposition formation**). Words that are recognized and kept active for one to two seconds, along with grammatical cueing, give the fluent reader time to integrate information in a way that makes sense in relation to what has been read before. As meaning elements are generated and then combined into clause-level propositional units, they are then integrated into text comprehension in a number of possible ways. This process is known as the "word-to-text integration" process (Perfetti, Stafura, & Adlof, 2013). The meaning elements and propositions

that connect closely with main concepts in a comprehension network become well integrated, become more active in memory, and become central ideas if they are repeated or reactivated multiple times.

This integration into text comprehension is depicted in Concept 1.6 (where bolding signifies repetition or reactivation). As each sentence from a text is read (on the left-hand side of the diagram), a semantic proposition of that information is constructed (as shown on the right-hand side). Each semantic proposition reflects the key elements of the input (word and structure) and also highlights linkages across important units (in this case, verbs), where relevant.

Concept 1.6: An Example of Semantic Proposition Formation



In the sentences in Concept 1.6, there are cause–effect relations between the first and second action and between the third and fourth action. In the semantic proposition network that is generated, these relations are incorporated as well (as indicated by the brackets from the first verbal predicate to the second verbal predicate, and the third verbal predicate to the fourth verbal predicate). The third sentence of the grammatical input actually has two propositions. One is signaled by "however," and it indicates a larger relation between sets of propositions; the other proposition reflects the new information presented in the sentence. Semantic propositions are formed in this way, and a propositional network of text meaning is created.

We can summarize this mini-text as follows:

> The text is about a man and his camera. A set of actions occurred that showed something about the man's attitude.

The reactivated concepts of "man" and "camera" across three clauses identified the man and camera as main actor and "acted upon." The paired cause and effect

sequences linked by "however" reflected something about the man's attitude to the camera.

Neurologically, the propositional network exemplified by Concept 1.6 is a neural net of information sending activation impulses among the activated units and drawing in (or activating) relevant background knowledge. In combination, the units form an integrated network of coherent information. It is worth noting that this process of semantic network building anticipates the discussion in the next section (on building a representation of text comprehension).

The process of ongoing semantic proposition formation and integration, as described here, is not easily controllable in any conscious way (much like fluent word recognition and syntactic parsing). Only when some aspect of comprehension does not work right, or the meaning does not seem to fit, might a reader pause to consider consciously how to extract the most appropriate meaning from the text being read. In such circumstances, we have time to become aware of the problem and address it more consciously.

The three processes discussed up to this point—lexical access or word recognition, syntactic parsing, and semantic proposition formation—are typically seen as lower-level processes that occur relatively automatically for the fluent reader. When they are functioning well, they work together effortlessly in working memory to help generate key parts of text meaning. They are key processes and language resources for word-to-text integration, which represents the onset of text comprehension. However, when they are not functioning fluently in combination, the reading comprehension process slows down considerably, and comprehension becomes more difficult to maintain. As a final note related to lower-level processing, we do not assume lower-level processes to be in any way easier to master than higher-level processes.

1.5.2 Higher-Level Processes

Added to these lower-level processes is a set of higher-level comprehension processes that more closely represent what we typically think of as reading comprehension. As fluent readers, we form a mental representation of what the text is likely to mean. We also construct a more elaborated interpretation of how we want to understand text meaning. Beyond understanding and interpreting the ideas represented in the text, we establish purposes for reading, combine reading strategies as needed, make inferences of several types as needed, draw extensively on background knowledge, monitor comprehension, form attitudes about the text and author, adjust goals as appropriate, and critically evaluate the information being read.

The most fundamental higher-level comprehension process is the coordination of ideas from a text that represent the main points and supporting ideas to form a meaning representation of the text. As clause-level meaning units are formed (drawing on information from lexical access and syntactic parsing), they are added to a growing network of ideas from the text. The new clauses may be hooked into the network in a number of ways: through the repetition of an idea,

event, object, or character; by reference to the same thing, but in different words; and by other semantic relations that generate a "**paraphrasing linkages**" (e.g., part–whole relationship, subordinate–superordinate relationship, complementary pairs, member–member relationship; Stafura & Perfetti, 2017). New words and clauses are also linked by semantic associations that automatically connect with related information in long-term memory (reflecting the recent concepts of semantic similarity and passive resonance; Cook & O'Brien, 2015; Kintsch, 2013; Perfetti & Stafura, 2015; van den Broek, Helder, & van Leijenhorst, 2013) and through inferences if they are needed. These, mostly automatic, implicit mechanisms create ways to connect a new meaning unit (a word or a phrase) to both related background knowledge and the ongoing text representation being generated.

As the reader continues processing text information and new meaning units are added, those ideas that are referred to repeatedly and that form usable linkages to other information begin to be viewed as the main ideas of the text. More technically, they become, and remain, more active in the network. Ideas that do not play any further roles in connecting to new information (i.e., ideas that are no longer named or referred to indirectly), or that do not support connecting inferences, lose their activity quickly and fade from the network. In this way, less important ideas tend to get pruned from the network, and only the more useful and important ideas remain active.

Quote 1.13

> What people remember is the gist …. For example, suppose you are beginning a paragraph-long text. The first sentence contains a number of ideas, with the reader coding the main idea of the sentence. This idea is held in active memory as the next sentence in the paragraph is read. Attempts are made to link the main idea from the first sentence to the ideas of the second sentence, with another main idea emerging from this synthesis, integrating the meanings expressed in the first two sentences of the paragraph …. Sometimes there will be a need for bridging inferences to reconcile the meaning of the previous sentences with the ideas in the new sentences …. Good readers do not make inferences willy-nilly, however.
>
> In summary, during normal beginning-to-end reading of a text, such as a story, the reader processes the individual ideas but remembers the gist. In processing the text and constructing the gist, prior knowledge plays an important role.
>
> Pressley (2006, pp. 53–54)

As the reader continues to build an understanding of the text, the set of main ideas forms a mental representation of text comprehension. The representation of text comprehension amounts to an internal summary of main ideas (which is one reason summary tasks for learning purposes are reasonable tasks to practice). The inferencing required of a reader to support comprehension is typically not extensive unless the text information is so new that the reader has comprehension

difficulties or unless the reader's language-proficiency level is impeding comprehension. Background knowledge (whether understood as linked networks of semantically related knowledge, instances of memory, or implicit mental models) plays a major role in **text representation** and helps the reader anticipate the **discourse organization** of the text as well as disambiguate word-level and clausal meanings as new information is incorporated into the text representation.

Quote 1.14

> If, when reading a particular text element, the concepts activated through the passive processes yield enough coherence to meet a reader's standards, then no strategic processes are intiated …. If the standards are not met … the strategic processes are initiated. Note that even strategic processes may take place without the reader being aware, for instance because they have become routinized through repeated experience.
>
> Van den Broek & Kendeou (2017, p. 288)

Quote 1.15

> At the core of comprehending a text is the construction of a coherent mental repesentation in which the various components of the text are semantically related to each other as well as to relevant background knowledge ….
>
> Van den Broek, Helder, & van Leijenhorst (2013, p. 133)

At the same time that text comprehension is being built by the reader, the reader begins to project a likely direction that the reading is taking. This projection is influenced by background knowledge, inferences, reader goals, reader motivation, reading task, text difficulty, and reader attitudes toward the text, task, and author. So almost immediately, the reader begins to interpret the information from the text in terms of his or her own goals, feelings, and background expectations. This reader interpretation (the **situation model of reader interpretation;** Kintsch, 2012) is built on and around the emerging text representation. The reader is likely to interpret the text (and begin to create a situation model) differently if he or she knows that the text is the beginning of a good mystery novel, a biography of a well-known photographer, or a social statement on waste in society.

For the fluent reader who has no great difficulties in understanding the text, the developing situation model of reader interpretation is the likely goal for reading comprehension. The situation model *integrates* text information with a well-developed network of ideas from the reader's background knowledge, and it *interprets* new information in light of reader background knowledge, attitudes, motivations, goals, and task purposes (Kintsch, 1998). The ability of fluent readers to integrate text and background information appropriately and efficiently is

the hallmark of expert reading in a topical domain (e.g., history, biology, psychology). The information from the situation model is ultimately what we retain in long-term memory, that is, what we have learned from reading the text.

The more elaborated situation model of reader interpretation accounts for how a reader can understand both what an author is trying to say (comprehending the text) and how the reader can interpret that information for his or her own purposes (the situation model). This duality of understanding explains how a reader can provide a summary of a text but also offers a critique of the text's position. It also explains how a reader can read a text (or a particular **genre**) to emphasize either what the author most likely means or what the reader wants the text to mean. The two levels of text comprehension also reveal different ways that background knowledge impacts our understanding of texts (automatically generated implicit knowledge and strategically generated inferential knowledge). Thus, a poem is usually read with the goal of creating a reader interpretation and calls for generating inferences, but a technical manual is usually read with the assumption that there is a preferred intended meaning by the author. In this way, we can also see how different genres both signal and lead to different ways of reading (in a sense, then, providing some of the justification for the existence of different genres).

This description of two higher-level processes highlights the roles of reader goals, attitudes, interpretations, and inferencing abilities in reading. As the reader transforms information from clause-level meaning units to text representation, and then to the elaborated situation model of reader interpretation, both background knowledge and inferencing (where appropriate) play important roles. Interestingly, it is at the point when the reader is interpreting the text (the situation model of reader interpretation) that wrong or incomplete background knowledge, or faulty inferences, can lead a reader, even a fluent reader, astray. For L2 readers, in particular, limited background knowledge, less well-developed vocabulary knowledge, and much less L2 reading experience are likely to lead to miscomprehension with challenging texts because these three limitations hinder accurate text representation.

Text representation and situation-model construction both require the abilities to monitor comprehension, use strategies as needed, reassess and reestablish goals, and repair comprehension problems. How such an attentional monitor (as an aspect of **central executive processing** in working memory) might operate cognitively is not entirely clear (see Baddeley, 2015; Baddeley, Eysenck, & Anderson, 2015; Cowan, 2015), but a large body of research has established the centrality of attentional processing (see Eysenck & Keane, 2015). Despite the lack of details, we know that an central executive processor (or monitor) represents our ability to focus selective attention while comprehending, assess our understanding of a text, and evaluate our success. Thus, our evaluation of the text information itself, or how we feel about the text, is typically part of our developing situation model (of reader interpretation). Our evaluation of how well we comprehend the text is dependent on a central executive processor in working memory.

In summary, the higher-level cognitive processes outlined here, in combination with the lower-level processes discussed earlier, form the cognitive processing resources that let us carry out reading for various purposes (also see Grabe, 2009). Usually, a specific reading purpose leads to greater or lesser emphases on different reading processes. So reading to find simple information highlights word recognition abilities and some background knowledge anticipation of what items (e.g., words, numbers) to look for. Reading for general comprehension uses a balanced combination of text representation and situation model interpretation. Reading to learn first emphasizes the building of an accurate representation of text meaning and simultaneously a strong interpretive situation model that integrates well with existing or revised background knowledge. In both reading to learn and reading to integrate, it is the well-formed situation model that is "learned" and retained in long-term memory.

1.5.3 General Cognitive and Neurolinguistic Processing

Much of what we learn in order to function in the world develops from our general cognitive processing skills that have become parts of human learning abilities, with learners having varying skills in each of these general cognitive abilities. It is likely that, long ago, humans who did not develop these complex cognitive processing abilities were greatly disadvantaged. Over thousands of years, they died away at faster rates than those humans with the innate cognitive skills that we now have.

Returning to the present, over the past 10 years especially, research across cognitive psychology, neurosciences, and reading have all peeled back layers of general cognitive skills that are not specific to reading but are essential to reading development. In this section, we do not provide extensive analyses of all of these abilities (see Concept 1.4), but a few are addressed here, even if quickly, because they are profoundly changing how researchers understand many complex cognitive skills, including reading. We should first note that language-specific abilities are driven by these more general innate processing and learning mechanisms rather than saying language arises from an unspecified but specific language organism for humans. Theories of L1 and L2 development following this line of research include usage models of language acquisition (e.g., Ellis, 2015; Tomasello, 2003), skills-based models (DeKeyser, 2015), and neurolinguistic-based models (Ullman, 2015). These approaches to language acquisition research line up well with more general cognitive psychologists and reading researchers with respect to general cognitive learning mechanisms (Eysenck & Keane, 2015; Seidenberg, 2017). We address only two of these general cognitive abilities here because they have profound implications for reading development and reading instruction: implicit learning and working memory.

Much of what we learn with respect to complex cognitive skills is learned implicitly, without awareness on the part of the learner (**implicit learning**). We learn to recognize patterns of all kinds in the input that we are exposed to. These patterns can be linguistic repetitions in recognizable sequences and with related

co-occurring linguistic forms. The keys to this general learning ability include our abilities to draw statistical probabilities (**statistical learning**) from extensive amounts of input over time and our powerful associative learning abilities that allow us to connect one idea to another idea, or one form to other forms, or one meaning to other meanings. **Associative learning,** relating one source of information with another, allows us to form larger units through **chunking** and form concepts and categories that shape our background knowledge. These two sub-systems of implicit learning contribute to our learning all the way from letter pattern co-occurrences and sequencing to discourse patterns shaping entire texts. Implicit learning, more generally, emerges from thousands of hours of input while carrying out meaningful and purposeful activities (Ellis, 2015; Frost, 2012; Siegelman & Frost, 2015; Seidenberg, 2017; Yurovsky, Fricker, & Yu, 2014). This learning leads to procedural automaticity and accounts for most of our fluent reading abilities. We would not be fluent readers without implicit learning abilities and implicit knowledge.

Working memory, as a second type of cognitive processing mechanism, is best understood informally as the activated network of information and related processes that are being used at a given moment (**working memory activation**) (see Baddeley, Eysenck, & Anderson, 2015; Cowan, 2015). As we look at Concept 1.5, we see information from both lower-level and higher-level processes as aspects of working memory processing. The words that are accessed, the information that is cued grammatically, the emerging meanings of words, the formation of text comprehension, inferencing, and central executive processes are all active in working memory. In the case of lower-level processes, the activation is brief, one or two seconds unless rehearsed or connected to new incoming information. In the case of higher-level processing, there is continual re-activation of main ideas as long as reading is continuing or the reader is reflecting on the text information (perhaps in an **episodic buffer** or in "**long-term working memory**") (Ericsson & Kintsch, 1995), two ideas for secondary storage of activated information).

If new information is to be integrated into text comprehension so that an accurate update of meaning is formed, the information must be combined rapidly. Working memory keeps *new* information active for about two seconds while it carries out the appropriate processes. For this reason, speed of processing is essential; it is not simply a nice additional aspect of comprehension abilities. If processing of active information is not done quickly enough, the information fades from memory and must be reactivated, taking more resources and making the reading process less efficient.

Working memory abilities certainly impact reading development and reading comprehension skills. However, having relatively weak working memory abilities does not consign developing readers to a lower skill level. Working memory processes are just one part of the skills, processes, and knowledge resources developed by learners while becoming more skilled readers. The combination of all of the general cognitive abilities and all of the linguistic skills and resources as well as the range of background knowledge brought to reading suggest that no one

general cognitive ability (operating within some normal cognitive range) determines a learner's level of reading ability. While working memory is important for reading comprehension, there are many pathways to becoming a fluent reader, and many combinations of skills and knowledge resources that can compensate for other less strong abilities in individual learners. One of the reasons to emphasize the roles of general cognitive abilities is to highlight the complexity of learning (including learning to read) and the multiple compensatory variations in the overall learning process. Learning to read is most certainly a combination of (a) basic cognitive abilities and (b) learned knowledge and skills developed through input, interaction, and effective practice. The remarkable complexity of learning to read leads us back to the miracle of reading.

1.6 A Description of the Miracle of Reading (Part II)

Reading comprehension processes as described in this chapter highlight the seemingly miraculous nature of reading comprehension. Reading comprehension is an extraordinary feat of balancing and coordinating many abilities within a very complex and rapid set of processes, allowing us to think that comprehension is an effortless and enjoyable activity for fluent readers. In fact, the many processes described here all occur in working memory or intersect with working memory, and they happen very quickly unless comprehension problems arise (see Concept 1.7).

Concept 1.7: Reading Processes Occurring Every Two Seconds We Read

Roughly, in any two seconds of reading, fluent readers:

1. Focus on and access 8–10 word meanings.
2. Extract from these words relevant grammatical information.
3. Use the grammar context to identify the right word meanings when words have multiple meanings.
4. Form phrase- and clause-level idea units (propositional units).
5. Find connections across new and prior phrase and clause units where information overlaps and connects a new meaning unit into the growing text comprehension network.
6. Identify main ideas that emerge from text structure and word signals, or from consistently repeated ideas and information.
7. Use background knowledge, as appropriate, for greater comprehension.
8. Use context to disambiguate meanings.
9. Monitor comprehension, recognize instances of non-comprehension, make appropriate inferences as needed, shift strategies and repair misunderstandings, as needed.

Concept 1.7 illustrates what fluent readers do (can do) in any two seconds of reading. Processes 2–9 may be occurring at the same time that the mind is identifying 8–10 word meanings every two seconds. This multifunctional processing is possible because most automatic processes can run in parallel (or almost in parallel) instead of sequentially. We often read in this way for enjoyment and can do it for an hour (or more) without stopping. Most miraculous of all is how many people become strong readers in a second or even a third language, and who are able to accomplish all this with limited effort.

Three conclusions become clear when we consider the number of reading processes occurring every two seconds:

1. Reading comprehension processes work largely in parallel when some skills are automatic.
2. Some processes need to be relatively automatic if reading is going to work efficiently.
3. Fast and efficient processing is the hallmark of fluent reading comprehension abilities.

It is important to emphasize, at this point, that these processes do not operate efficiently or effortlessly when readers encounter texts (and accompanying tasks) that are too difficult for them. Difficulties may arise when readers do not have adequate background information, do not have the necessary linguistic resources, or have not read enough in the language to have developed efficiencies in reading. Readers, especially L2 readers, who encounter such difficulties can try to understand the text by using a slow mechanical translation process; alternatively, they can make an effort to form a situation model from past experiences and try to force the text to fit preconceived notions. In the first case, working memory efficiencies cannot operate well; in the latter case, a situation model unconnected to text information is imposed on reading comprehension, activating inappropriate background information and leading to poor comprehension. In either case, successful reading comprehension is not likely to occur.

In L2 reading contexts, where such problems commonly arise, readers resort to coping strategies by translating or by guessing to form a coherent account of the text, whether that account matches the text or not. If this experience is repeated on a continual basis, it is not hard to see why these learners lose motivation to read. Yet this problem also suggests a likely long-range solution. Students need to engage in reading for many hours at text- and task-levels appropriate to their abilities. It is only through extended exposure to meaningful print that texts can be processed efficiently and that students become motivated and develop as fluent readers.

1.7 Three Models and an Approach

Many researchers attempt to create a general understanding of the reading comprehension process by means of some reasonable mental theory, so we often read

about generalized **models of reading: bottom-up models** and **top-down models** (not to be confused with text representation and situation model concepts for comprehension processes that were discussed earlier). General models of reading serve useful purposes, most commonly by providing a metaphorical generalization of the many processes involved in reading comprehension. Some views emphasize the lower-level processes as critical for reading; others emphasize the higher-level processes for reading, although no general model would be complete without some combination of both perspectives. These generalized perspectives are only metaphoric and do not explain what readers do as they try to understand a text. Finally, it is important to note that reading comprehension conceptualized as a generalized top-down process (the Psycholinguistic Guessing Game Model) has been discredited for decades in reading research and cognitive psychology (Grabe, 2009; Seidenberg, 2017).

Three more-specific models of reading, widely cited by contemporary reading researchers, are introduced in this section. They seek to explain how readers achieve some successful level of reading comprehension, accounting for the cognitive and linguistic resources, along with cognitive processes, that take a reader from visual recognition of words to some overall understanding of what a text is about. An assumed goal is to assemble research evidence to support a proposed model and test the model further. However, as we have argued in this chapter, no model can fully explain how readers achieve reading comprehension in varying contexts, with different texts, and with individual differences among readers. Having said this, some models of reading provide explanations that incorporate persuasive research findings and plausible sets of processes to explain how reading comprehension is achieved. This section introduces three of the most persuasive models of reading. We then take one step back from formal "models" to introduce a reading systems approach to understanding comprehension that does not claim to provide a precise formal (testable) model, on its own, of how comprehension is achieved (Concept 1.8).

Concept 1.8: Ways of Explaining How Reading Works: Three Models and an Approach

1. Three Models of Reading
   a. Simple View of Reading Model
   b. Construction-Integration Model
   c. Landscape Model of Reading
2. Reading Systems Framework Approach

1.7.1 Three Models of Reading

One of the most frequently cited models of reading is the **Simple View of Reading** (SVR). The SVR model is supported by a large amount of data and many research

studies that converge reasonably well. This model was first proposed in the mid-1980s (see Hoover & Gough, 1990) and still generates consistently important results in current research studies (see Alderson et al., 2016; Jeon & Yamashita, 2014; Kim, 2017; Schwanenflugel & Knapp, 2016; Verhoeven & van Leeuwe, 2012). At its heart, the SVR states simply that a combination of listening comprehension skills (or oral language knowledge) and word recognition skills, when reliably measured, are two key factors that explain reading comprehension abilities across proficiency levels, across ages, and across different L1s. To this point, the SVR has been supported in many languages: English, Chinese, Dutch, Greek, Hebrew, Italian, Korean, Malay, Portuguese, and Spanish (among others). The near universality of the SVR has been confirmed in perhaps hundreds of studies by now. Thus, reading is, in part, a combination of word recognition abilities and language abilities more generally.

Quote 1.16

> Research shows that the simple view of reading equally holds for L1 and L2 reading. In both cases, variation in reading comprehension can be seen to be largely the product of children's word decoding and listening comprehension—including their vocabulary, **morphological awareness**, and syntactic abilities.
>
> Verhoeven (2017, p. 225)

Verhoeven's (2017) interpretation of the SVR (in Quote 1.16) provides a reasonable account of individual differences in reading abilities. At issue for SVR is how exactly decoding and language comprehension should be measured, how scores for decoding and comprehension should be combined, and what other factors might be added for an improved explanation of reading abilities (e.g., passage reading fluency, motivation, background knowledge, metacognitive awareness, vocabulary, syntax measures). The major drawback of the SVR as a model of reading is that it does not explain *how* reading comprehension emerges while reading a text or over time as a reader's proficiency increases. Instead, it states a simple fact that does appear to be a universal statement about reading ability (Verhoeven & Perfetti, 2017b). At present, the Simple View of Reading is among the most influential interpretations of reading abilities among reading researchers and it has obvious implications for reading instruction.

Kintsch's (1998, 2012) **Construction-Integration (C-I) Model** of comprehension focuses on a set of cognitive processes that generate comprehension. The model incorporates the twin concepts of **text model** and situation model (first proposed by Kintsch in the early 1980s). Early iterations of the C-I Model moved away from the strong top-down views of the 1970s and 1980s and focused on the immediate processing of clauses, the *construction* phase. The *integration* phase, the second phase, focused on integrating the propositional structures into the text model and the situation model. The text model itself is a clause-by-clause construction with more central thematic information

becoming more active cognitively as the reader progresses through a text. Less important information, misread information, and information just mentioned in passing are suppressed as part of the underlying cognitive processes that help form the text model. The situation model represents a final interpretive understanding of the text or what is learned from the text and stored in long-term memory.

Quote 1.17

> The text base contains the information that is directly expressed in the text, organized and structured in the way that the author had organized the material …. On the basis of the text base, readers can verify statements they have read, they can answer questions about the text, they can recall the text, or they can summarize it ….
>
> The situation model integrates the information provided by the text with prior knowledge, often reorganizing and restructuring it in terms of the reader's understanding of the knowledge domain as a whole rather than the particular text just read.
>
> McNamara, Kintsch, Songer, and Kintsch (1996, pp. 3–4)

Background knowledge (long-term memory) is centrally important as part of the C-I explanation of text comprehension, and it is important for making simple (and automatic) bridging inferences to help link together the information from one clause to the next. The integration process establishes the appropriate meaning and the quick deactivation of contextually inappropriate meanings. Text comprehension also requires connecting the text base with relevant background knowledge. As noted earlier in this chapter, the situation model is built upon the text model almost simultaneously to add a personal interpretation of what the text means (for the reader).

The C-I Model offers a number of strengths as a model of reading. It provides a processing explanation for text comprehension. The *construction* part of the clause-by-clause process develops propositional structures that indicate how the syntactic-semantic units in a text are combined to build text comprehension. The idea that there is a text model and a situation model allows for a way to incorporate inferential support for text comprehension via the situation model. This latter model takes greater account of a reader's background knowledge, and it provides a way for readers to process more challenging texts. In a sense, the situation model identifies where in the overall theory of reading inferences other than simple **bridging inferences** can be applied.

The C-I Model of comprehension, like other models of reading, has its limitations. How text comprehension is generated is still somewhat abstract with only generalized descriptions for how background knowledge and inferences provide fully specified comprehension outcomes. This is a limitation especially in light of more recent arguments that background knowledge resources generate most text integration linkages automatically between a new clause and the prior text, undercutting the argument for a text model concept with limited connections to

background knowledge (e.g., Cook & O'Brien, 2015; Perfetti & Stafura, 2015; Stafura & Perfetti, 2017; van den Broek, Beker, & Oudega, 2015). Only when comprehension challenges are demanding and a reader's "**standard of coherence**" goal-setting is high are **elaborative inferences** (causal, explanatory, and predictive inferences) generated to incorporate extensive prior knowledge and problem-solving resources.

Like the C-I Model, the **Landscape Model of Reading**, proposed by van den Broek, Young, Tzeng, and Linderholm (1999), focuses on the relationship between comprehension processes and the resulting network of ideas that is created and updated over real time during reading. The argument is that the concepts and propositions activated during reading fluctuate as readers progress through a text. As new ideas receive more activation, they change the set of main ideas being developed as the text is being processed, thus altering the *landscape* of comprehension (but without proposing the specific text and situation models). The outcome of this reading process is viewed as a mental representation of the text. Overall, the Landscape Model is similar to the C-I Model in that it focuses on how a set of main ideas and supporting ideas are generated to represent reading comprehension.

Quote 1.18

> As the reader proceeds through a text, each newly read element may trigger a somewhat different combination of processes, resulting in fluctuations in processing activities. The connections that are identified at a particular element result in the updating of the text representation that has been constructed so far: the updated representation, in turn, forms the backdrop for interpreting the next element, which results in a new cycle of updating.
>
> van den Broek and Kendeou (2017, p. 285)

The Landscape Model further specifies that individual readers differ in numerous ways that will influence their comprehension. Working memory, processing abilities, background knowledge, syntactic and semantic knowledge, and so forth all influence the resources available to the reader in making sense of the text. A number of innovative research studies have supported this conceptualization of reading comprehension processes, including the effects of reading purpose on text processing (Linderholm & van den Broek, 2002; Linderholm, Kwon, & Wang, 2011; Yeari, van den Broek, & Oudega, 2015). Van den Broek and colleagues have argued persuasively that readers' attempts to achieve standards of coherence (the level of comprehension effort required) are based on their reading purpose, and readers adjust cognitive processes to fit different reading purposes, such as reading to study versus reading for entertainment.

When only a lower standard of coherence is set, then either gaps in understanding are acceptable to the reader, or text processing is mostly carried out with automatic connections to relevant background knowledge. In contrast,

when readers adopt a higher standard of coherence, they expend additional effort to deepen and embellish understanding to ensure that intricate text details are integrated into a coherent model. Clearly, the purpose for reading and the standard of coherence adopted while reading influence what is read, how it is processed, and how deep the level of understanding reached is (van den Broek & Kendeou, 2017).

The limitations with the Landscape Model of Reading are similar to those noted for the C-I Model. The Landscape Model is somewhat abstract and the role of lower-level processing is not specified except as outcomes for linking into an overall model of text comprehension. Furthermore, relatively few specific studies track the path of a landscape model, and little work has been done with a variety of text genres. What can be said for both the C-I Model and the Landscape Model is that they offer a mechanism of comprehension processing that can be supported with a range of research studies and that take comprehension into the realm of discourse-level research rather than leaving such an obvious gap in explaining reading comprehension. In short, both models create a bridge from studies of specific variables that impact reading, such as vocabulary, grammar, working memory, and background knowledge, to a plausible approach for how we understand entire texts.

1.7.2 Reading Systems Framework Approach

Quote 1.19

> Many efforts at instructional "theory" are really frameworks … because they do not lead directly to precise predictions. Nevertheless, a theoretical framework does entail a hypothesis-testing research agenda.
>
> Koedinger, Corbett, and Perfetti (2012, p. 760)

Over years of research, Charles Perfetti (and colleagues) have explored the impact of dozens of variables on reading comprehension (see Chapter 3 for further details). One conclusion that Perfetti has drawn is that there cannot be any one model of reading that provides a complete explanation of the reading comprehension process. A stronger research approach can be developed that explains a plausible set of cognitive processes and linguistic knowledge resources in an overall "framework" that helps us better understand reading comprehension. Comprehension difficulties, or "pressure points," can arise for different readers at multiple locations, and in multiple ways, in the overall framework. The framework also provides ways to translate research outcomes into principled conceptualizations of reading instruction and assessment while, at the same time, consider types of learner difficulties impacting reading development and possible instructional interventions.

The **Reading Systems Framework approach** outlines the likely comprehension process from visual input of the print forms of words in a text all the way to the situation model that interacts strongly with a reader's general knowledge. It develops a strong specification of word recognition and lexical access. Lexical access, in turn, initiates the word-to-text integration process. The outcome of this word-by-word and clause-by-clause process is text comprehension integration. One of the outstanding values of this conceptualization of reading ability and reading development is that the Reading Systems Framework encourages exploration of many factors that can impact reading comprehension and lead to differences in reading outcomes. This approach supports research on a wide range of possible predictors of reading ability and can incorporate key ideas of several models of reading. It can identify knowledge resources and cognitive processes that lead to reading difficulties. It offers a flexible synthesis approach that is also justified by a range of empirical research studies. A fuller interpretation and visualization of the reading systems framework approach is provided in the first section of Chapter 3.

1.8 Conclusion

In this chapter, we have outlined a view of reading that is well supported by current research in English L1 contexts (and several other L1s, Verhoeven & Perfetti, 2017a) and that is compatible with L2 reading research of the past 20 years. Beginning with our discussion of purposes for reading and our extended definition of reading comprehension, we have described current research views on reading comprehension while also providing explanations that have real implications for instructional contexts. We have also developed an account that focuses on individual reader processing (a cognitive processing perspective). This emphasis on individual processes is not intended to deny the relevance of social factors on reading development (e.g., family literacy experiences, social group experiences, socioeconomic status, prior schooling experiences, peer and sibling interaction around literacy events; see Grabe, 2009) or the relevance of social contexts on reading purposes and processes themselves (see Chapter 2). Rather, our intention is to highlight information that may not be well known among reading teachers. The goal is to raise awareness of issues that curriculum planners and teachers should consider if reading instruction is to be appropriate for student needs and institutional expectations. Our view of reading, as depicted in Appendix 1-A, reveals the complex nature of reading and the many factors that must be taken into account when assessing students' needs and planning meaningful reading instruction.

As we pointed out earlier, much of the research that supports the views presented in this chapter are drawn from L1 contexts. In the next chapter, we explore the differences between L1 and L2 reading. These differences should influence our interpretation of L2 reading comprehension abilities, the development of L2 abilities, and the implications for reading instruction.

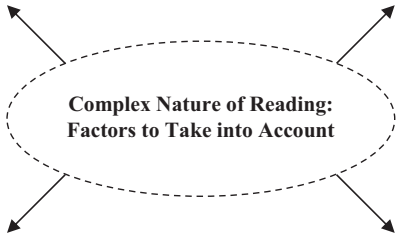
Appendix 1-A: Factors to Take into Account When Considering the Complex Nature of Reading

Purposes for Reading

- Reading to search for simple information
- Reading to skim quickly
- Reading to learn from texts
- Reading to integrate information
- Reading to write (or to search for information needed for writing)
- Reading to critique texts
- Reading for general comprehension

Processes Required for Fluent Reading

- A rapid process
- An efficient process
- An interactive process
- A strategic process
- A flexible process
- An evaluating process
- A purposeful process
- A comprehending process
- A learning process
- A linguistic process



Components of Reading

- Working memory processing (including central executive processes)
- Lower-level components
  - (Phonological processing of print)
  - Lexical access
  - Syntactic parsing
  - Semantic proposition formation
- Higher-level components
  - Text representation
  - Situation model of reader interpretation
- Background knowledge use (long-term memory) and inferencing
- Underlying cognitive processing abilities

Sources of Knowledge

- Knowledge of language
  - Phonological knowledge
  - Word and word-part knowledge
  - Grammar knowledge
  - Text structure knowledge
- Knowledge of orthography
- Background knowledge
  - General knowledge
  - Domain knowledge
  - Genre knowledge
  - Topic knowledge of text being read

Models of Reading

- Specific Models of Reading
  - Simple View of Reading Model
  - Construction-Integration Model
  - Landscape Model
- Reading Systems Framework Approach

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The additional citations contained in this Further Reading section provide key information on areas introduced in the chapter (see also Chapter 10).

- *Variations on the reading-to-learn concept*, see Grabe and Stoller (2019), Rouet and Britt (2011), Yamashita and Koda (2019).
- *Current comprehensive overviews of general reading comprehension*, see Afflerbach (2016), Cain, Compton, and Parrila (2017), Israel (2017), Kamil, Pearson, Moje, and Afflerbach (2011), McNamara and Magliano (2009), O'Brien, Cook, and Lorch Jr. (2015), Pollatsek and Treiman (2015), Snowling and Hulme, 2005.
- *Models of reading*, see Ahmed et al. (2016), Britt, Goldman, and Rouet (2013), McNamara and Magliano (2009).

Notes

1 From UNESCO literacy data, 2016; accessed on 19 December 2018 at http://data.uis.unesco.org/ and World Bank 2016 data for world population ages 15–64 at 4.9 billion, accessed on 19 December 2018 at https://data.worldbank.org/indicator/SP.POP.1564.TO?view=chart.

2 Words or phrases that are printed in **bold** throughout the volume are defined in the Glossary at the end of the book. In a number of cases, the terms in bold are not meant to be the key terms for the subsection, but only a cue to look at the glossary if more explanation is needed.

2 Comparing L1 and L2 Reading

This chapter highlights differences that exist between first language (L1) and second language (L2) reading contexts and readers. In addition, it explores how those differences might influence classroom instruction. Three major types of differences form the core of the discussion, while the final section showcases L1–L2 similarities:

- Linguistic and processing differences.
- Individual and experiential differences.
- Socio-cultural and institutional differences.
- L1–L2 reading similarities.

One of the more difficult tasks that we face as reading teachers is deciding how to use reading research for our own purposes. The research on reading comprehension in L1 contexts is extensive and complex. Research studies have looked at children and students ranging from three-year-olds to university level. Some studies have explored comprehension by varying the purposes for reading through a number of different tasks. Others have emphasized different skills that are usually considered part of reading comprehension. For example, some studies focus on reading strategies, others explore vocabulary development, still others examine the role of **discourse organization** and **text structure**, and yet others emphasize word recognition and reading **fluency**. Aside from linguistic skills and knowledge resources, studies have also examined multiple underlying cognitive skills such as working memory, background knowledge, motivation, or implicit learning skills. Students participating in these studies have come from a range of social and ethnic backgrounds, with varying motivations and attitudes toward reading. As one might imagine, this range of emphases and reader variables makes it hard to generalize from the research literature to any specific classroom context, whether L1 or L2.

In L2 contexts, the issues become even more complex. L2 students and research settings can vary as widely as those described for L1 contexts. In addition, L2 students have much wider ranges of L2 language proficiencies, unlike most L1 readers who know thousands of words and have considerable tacit grammatical knowledge by the time they begin to read. Many L2 students have

often already had experiences learning to read in an L1 more or less successfully (though others may have no L1 literacy experience). Moreover, they come with linguistic knowledge of their L1, even if most of it is tacit knowledge, and this knowledge can either support the transfer of reading skills or become a source of interference.

Research efforts in L2 contexts also extend beyond the array of issues pertinent to L1 studies. For example, they explore the role of relatively low-level L2 proficiency on reading abilities, on the impact of **transfer** at various L2 ability levels, on various reading processes (e.g., word recognition, syntactic parsing, strategy use), and on the use of different knowledge resources (e.g., different general background knowledge, specific topical knowledge, and cultural knowledge). Adding more complexity to L2 contexts are the comparisons among bilingual children, children or adolescents who learn an L2 subsequent to their L1, and learners with little to no formal instruction in their L1s. There are also large differences across *second* language learners and *foreign* language learners (Alderson et al., 2015).

Aside from the additional complexities inherent to research in L2 contexts, there are logistical difficulties with carrying out large-scale studies in many L2 settings because many sites for research cannot track L2 students for long periods of time. Moreover, the follow-up research that commonly occurs in L1 settings is done less frequently in L2 settings. There are also relatively fewer L2 reading researchers to carry out such projects. These factors make it more difficult to assert broad generalizations from research in L2 contexts. Strong generalizations can be developed for L2 reading only after several near replications of a research study across a number of L1 groups, L2 proficiency levels, and socio-cultural and institutional learning contexts.

The differences between L1 and L2 reading contexts, however, go beyond numbers of studies and limitations of research methodology. L2 reading must account for issues that are qualitatively different from L1 issues. L2 learners, while learning to read, must simultaneously broaden their linguistic knowledge bases, deal with transfer effects, and learn to use L2-specific resources (e.g., translation, glosses, bilingual dictionaries), among many other factors. If this were not enough, the L2 reader learns to read in the L2 with a two-language processing system. In other words, reading in an L2 is supported by a two-language system (L1 and L2 together) rather than just an L2 system. (The L1 never completely turns off.) All of these factors suggest that L2 reading can be quite different from L1 reading.

This chapter outlines 15 ways L2 reading comprehension processes and instruction may differ from L1 contexts. We have divided the 15 differences into three general areas: linguistic and processing differences, individual and experiential differences, and socio-cultural and institutional differences. Despite all of these differences, there are, nonetheless, remarkable similarities across both reading in different languages (Verhoeven & Perfetti, 2017a) and in reading across L1 and L2 contexts (Verhoeven, 2017). These similarities are summarized in the closing section of the chapter.

2.1 Linguistic and Processing Differences between L1 and L2 Readers

This section presents six major differences between L1 and L2 readers involving vocabulary, grammar, discourse, orthography, and metalinguistic and metacognitive issues (see Table 2.1). The linguistic and processing issues inherent in these differences are actually the most widely studied aspects of L2 reading development; quite a bit of research has been done to help us understand these differences and their possible impact on reading comprehension abilities (Jeon & Yamashita, 2014; Melby-Verlåg & Verlåg, 2014). These differences highlight issues related to a possible L2 threshold, language transfer, differences across various student L1s, and the simple fact that two languages are involved in comprehension processing in L2 settings.

2.1.1 Differing Amounts of Lexical, Grammatical, and Discourse Knowledge

As a first difference, most L1 students first begin to read after they have been learning their L1 orally for 4–5 years. In the US, students typically begin to read (formally) at the age of 6, in the 1st grade. By this time, they have learned most of the basic grammatical structures of their L1 as tacit knowledge (Finegan, 2015; Tomasello, 2003). Further learning of the language structures commonly used in written texts continues regularly through the age of 12, but most of the basic structures are already well learned. Estimates of the vocabulary knowledge of a six-year-old vary considerably, but a commonly agreed upon range is 5,000–7,000 words (Cunningham, 2005; Graves, 2016). As a starting point, we can assume that a six-year-old in the 1st grade knows about 6,000 words (including inflectional variants) when reading instruction begins. These linguistic resources provide a tremendous boost for young L1 students learning to read. It does not take much reflection to recognize how different this situation is from most L2 contexts (Grabe, 2009; Nassaji, 2014; Webb & Nation, 2017).

Unlike the L1 student's initial linguistic resource base, many L2 students begin to read simple sentences and passages almost at the same time that they learn the language orally. Other L2 students, primarily in academic reading courses, are not even expected to increase their oral L2 abilities to keep up with their reading development. It is true that curricula in certain L2 contexts

Table 2.1 Linguistic and Processing Differences between L1 and L2 Readers

1. Differing amounts of lexical, grammatical, and discourse knowledge at initial stages of L1 and L2 reading
2. Greater metalinguistic and metacognitive awareness in L2 settings
3. Varying linguistic differences across any two languages
4. Varying L2 proficiencies as a foundation for L2 reading
5. Varying language transfer influences
6. Interacting influence of working with two languages

(e.g., in some elementary-school ESL and bilingual settings in the U.S., the U.K., and Australia) encourage L2 oral use before a student begins to read, but this encouragement is extremely variable and also controversial as a curricular principle. This sequencing may do more harm than good for L2 students who commonly fall several grade levels behind L1 students in reading ability in elementary school years (Kieffer, 2011; Mancilla-Martinez & Lesaux, 2010, 2017).

In most cases, the vocabulary and grammar knowledge of the beginning L2 student marks a very different starting point from that of the beginning L1 reader. One obvious implication of these differences is that having L2 students sound out a word to "discover" its meaning is likely to be somewhat less effective than it is in L1 settings (though not without value in L2 contexts). Beginning L2 students do not have a mental resource of several thousand words stored in their heads to be matched with the newly sounded out word. Thus, one benefit of developing accurate letter–sound correspondences as a support for reading is limited in most low-proficiency L2 settings. Nonetheless, L2 students need to master accurate letter–sound correspondences as quickly as possible to connect print with high frequency words they may know orally. (This letter–sound matching skill is especially needed if they have not been in a mainstream L2 classroom from the 1st grade.)

The lack of tacit L2 grammatical knowledge and discourse knowledge also suggests that L2 students need a considerable instructional foundation of structural knowledge and text organization in the L2 for more effective reading comprehension. How much of a grammar and discourse foundation is needed is an open question, and one that is likely to vary considerably depending on the students being taught. Arguments that L2 readers do not need knowledge of grammar, occasionally voiced in the L2 literature, are clearly wrong (see Alderson et al., 2015; Grabe, 2009; Jeon & Yamashita, 2014; Verhoeven, 2017). Syntactic knowledge generally becomes a major predictor of L2 reading comprehension in later K–12 grades for students. Knowledge of discourse organization is also very important for students who read L2 texts in more advanced academic settings; thus, patterns of discourse organization need explicit attention (Geva & Ramirez, 2015; McCardle, Chhabra, & Kapinus, 2008). Sometimes, L2 students may know most of the vocabulary and understand the main concept(s) in a text, but they may not follow the specific development of the text, the new information being presented, or the arguments being made. In some cases, L2 students may not be fully familiar with overall genre expectations of certain types of texts (e.g., news stories, biographies, abstracts, reports, memos, editorials, and online blogs). Students recognize that something is not working the way they expect, but they do not know why.

Quote 2.1

> Knowledge about text genre is an important factor in reading comprehension …. Readers unaware of [text] structure will likely not have a plan of action for a particular text and

> may gain information from that text in a random manner, whereas those who are aware of the way a text is structured are better able to organize information as they read.
>
> McCardle, Chhabra, and Kapinus (2008, pp. 145–146)

2.1.2 Greater Metalinguistic and Metacognitive Awareness in L2 Settings

The general need to teach vocabulary, grammar, and **discourse structure** in L2 settings from the very beginning acts as a support for early reading development and highlights our second L1–L2 difference: L2 readers often develop a greater awareness of the L2 itself through instruction, unlike L1 readers who typically have a more tacit knowledge of their native language (Koda, 2008). In many L2 contexts (but not all), a good part of the students' knowledge of the L2 results from direct classroom instruction, or it comes about indirectly through instructional tasks, projects, and outside reading. In these more explicit learning situations, students develop a greater **metalinguistic awareness** of language knowledge as a resource for reading. With the recent emphasis on awareness and reflection for language learning in L2 contexts, more L2 students now discuss, and reflect on, the linguistic resources (e.g., vocabulary, **morphology**, grammar, and discourse knowledge) that they use to assist them in comprehension (Nagy & Scott, 2000). Unlike the tacit knowledge from thousands of hours of reading exposure that is typical of L1 learners, many older L2 students are often able to discuss and reflect on the linguistic resources available to them.

Quote 2.2

> Much attention has been devoted to a particular kind of metalinguistic ability, phonemic awareness (i.e., the ability to reflect on and manipulate phonemes, the individual units of sound out of which spoken words are constructed). However, other types of metalinguistic awareness, such as morphological awareness and syntactic awareness, are also believed to play an important role in reading.
>
> Nagy and Scott (2000, p. 274)

From a broader perspective, **metacognitive awareness** is a natural extension of linguistic awareness to a range of cognitive activities that can be used while reading to support learning (and comprehension). Many younger students growing up bilingually or in second language (rather than foreign language) environments may approach L2 reading with many of the tacit resources of the L1 student, yet a large percentage of L2 students approach L2 reading with quite different, and often more limited, linguistic and learning backgrounds. In many second and foreign language academic settings, L2 students begin to read in their L2 only after they have been learning literacy skills and content knowledge for several years

in their L1s. As a result, they develop a greater awareness of (a) how they have learned to read because of their instructed L2 learning efforts, (b) what learning strategies can work for them based on L1 experiences with challenging texts, and (c) how language knowledge and background knowledge can support literacy development. In effect, they are, on the whole, better comprehension problem solvers while reading if they can overcome their more limited L2 language proficiency (Veenman, 2016).

L2 students can more easily bring their metalinguistic knowledge to a conscious level (e.g., learned vocabulary knowledge, **morphological knowledge**, syntactic knowledge) to support effective reading strategy choices or to recognize comprehension failure (and in the process become more strategic readers). For example, while we do not believe that all L1 reading strategies transfer automatically to L2 reading contexts, it is still far easier to raise learner awareness of, and practice with, strategies that have been productive for them in L1 situations than would be the case with strategies that have never been used before by learners.

Quote 2.3

> During reading, metacognitively proficient readers keep a close watch on their reading behaviors. They monitor their comprehension … whenever they encounter confusions or miscomprehensions, they take actions to remedy their lack of understanding by consulting a dictionary, by backtracking and re-reading the text carefully, or by purposefully navigating through the text in search of information ….
>
> Metacognitively proficient students also select methods for actively processing text during reading. They close read and paraphrase difficult text parts, they generate self-questions, they draw conclusions and make inferences, they relate new information to prior knowledge, [and] they take notes and selectively highlight or underline text.
>
> Veenman (2016, p. 29)

Concept 2.1: Metalinguistic and Metacognitive Knowledge

Metalinguistic knowledge: Our knowledge of how language works. Metalinguistic knowledge includes knowledge of letters and sounds and how they relate, knowledge of words and word parts, knowledge of sentences and their parts, and knowledge of texts and genres and how they are organized.

Metacognitive knowledge: Our knowledge of what we know. Simply put, this knowledge permits us to reflect on our planning, goal setting, processing of tasks, monitoring of progress, recognition of problems, and repair of

problems. Metacognitive knowledge represents a basic way to understand learning strategies, especially our explicit and conscious use of reading strategies.

In both cases, our knowledge includes not only what we know (declarative knowledge) but also how we use this knowledge (procedural and conditional knowledge). In both cases, it is not straightforward to assert a separation between linguistic and metalinguistic knowledge or between cognitive knowledge and metacognitive knowledge.

2.1.3 Varying Linguistic Differences across Any Two Languages

Linguistic differences across any two languages are likely to vary considerably, and these differences may influence L2 reading comprehension variably when students come from different L1s and are in the same L2 classroom. For example, students whose L1 is a Romance language (e.g., French, Italian, Portuguese, Spanish) tend to pay greater attention to the ends of words because there is much more grammatical information in the suffixes of their L1s than in English. Another illustrative example involves Czech-speaking children who demonstrated greater awareness of consonant clusters and complex consonants than did English-speaking children (Caravolas, 2017). As another example, words in languages such as Hebrew and Arabic, which have greater morphological complexity with embedded grammatical information, are read more slowly than words in a language such as English (Frost, Siegelman, Narkiss, & Afek, 2013). Morphological knowledge also varies across different L1s. For example, Chinese L1 learners are more skilled at learning English compounding that creates more complex words in L2 English, while Spanish L1 students are more skilled at learning derivational affixes and more derivationally complex L2 English words (Hipfner-Boucher & Chen, 2016). Another difference, which has been supported in multiple studies, reveals that readers of Chinese and Japanese make greater use of visual processing than do readers of English because of their L1 **orthography** (Koda, 2016). There is also evidence that these differences lead to variation in reading rates and fluency in word processing, though these specific issues need much more research before any implications might be suggested for instruction (Koda, 2008; Nassaji, 2014).

Two further differences across L1s with more general implications for L2 reading include orthographic differences and the extent of shared vocabulary or **cognates**. With regard to orthographic differences across languages, differing orthographies are more or less transparent with respect to **letter–sound correspondences** (sometimes referred to as the **Orthographic Depth Hypothesis**; see Concept 2.2). That is, depending on the transparency of the orthography, a reader looking at a word will be able to sound out the word (or activate the word

sounds in working memory) more or less easily. Some languages are seen as almost completely transparent (e.g., Finnish, Serbo-Croatian, Turkish); others are quite transparent (e.g., Greek, Italian, Spanish), and some a bit less so (e.g., German, Swedish); some are relatively more opaque (e.g., Danish, French), and some very opaque for an alphabetic language (e.g., English). Consonantal alphabetic languages are even more opaque (e.g., unpointed Hebrew and Arabic), and some are very opaque (e.g., Japanese and Chinese are not alphabetic scripts) (Frost, 2005; Nassaji, 2014; Perfetti & Dunlap, 2008; Verhoeven & Perfetti, 2017a).

The key issue across languages is that learners of transparent languages acquire phonological awareness much more easily than learners of more opaque languages (such as English). While phonological awareness is a strong predictor of word recognition and reading comprehension for English-speaking children through 4th grade, phonological processing skills are highly accurate for children in transparent languages usually by the end of 1st grade. In languages such as Spanish, Italian, and German, the speed of word-recognition processing becomes a more important predictor of reading development across elementary school years. Children learning a more transparent L1 will acquire phonological awareness more quickly in support of their learning a less transparent L2. But more generally, as long as both languages are fully alphabetic, phonological awareness transfers consistently across alphabetic languages; as soon as a reader understands the concept of letter–sound correspondences in an L1, this ability seems to transfer to reading in another language (Geva, 2016; Nassaji, 2014).

Concept 2.2: Orthographic Depth Hypothesis

> The Orthographic Depth Hypothesis (ODH) asserts that a continuum of orthographic transparency … influences the strategies adopted by readers. The more shallow or transparent the orthography—that is, the more reliable the correspondence between graphemes and speech segments—the more the reader uses a print-to-sound decoding strategy. The deeper or less transparent the orthography, the more the reader uses a direct look-up of the word (that is, sight word reading), without grapheme-speech decoding.
>
> (Perfetti and Dunlap, 2008, p. 18)

At present, recognizing that there are many other language–distance factors that influence reading, the research suggests that readers process words somewhat differently in transparent and opaque orthographies. In general, L2 students tend to draw on L1 processing skills when they try to read the L2, although the tendency influences beginning L2 reading more than advanced L2 reading. For example, in beginning L2 adult reading, students must adapt from a lifetime of efficient word recognition processing in the L1 to accommodate word recognition processes in the L2. Increasing evidence suggests that the orthography of a student's L1 influences L2 reading development even among advanced L2 readers (Koda, 2016).

Understanding more about a student's L1 literacy skills and orthography may help explain possible difficulties in word recognition, fluency, and reading rate (Koda, 2008).

The final issue involving differences across L1s and across any two languages (L1s and L2s) relates to the role of cognates. The development of L1 reading does not involve the use of cognates as support for reading comprehension. In L2 contexts, however, cognates may play a large role in supporting reading comprehension, depending on the particular L1 and L2 (Wolters & Helms-Park, 2016). For example, for interesting historical reasons, French and English share thousands of cognates, and those cognates are particularly useful at more advanced levels of reading. By extension, Spanish, Portuguese, and Italian all share thousands of useful cognates with English. In cases where a student has a Romance language as an L1 and is learning to read in English, cognates represent a significant resource if we help students recognize and use them (Fraser, Massey-Garrison, & Geva, 2016). When students come from an L1 such as Chinese, there are very few cognates to assist them in L2 reading development. When many cognates are available, this resource may support some transfer of reading comprehension skills to the L2.

2.1.4 Varying L2 Proficiencies as a Foundation for L2 Reading

L2 proficiency plays a large role as a foundation for L2 reading (often discussed in the context of the Language Threshold Hypothesis). The Language Threshold Hypothesis argues that students must have a sufficient amount of L2 knowledge (i.e., vocabulary, grammar, and discourse) to make effective use of skills and strategies that are part of their L1 reading comprehension abilities (Clarke, 1980). The fundamental issue for L2 reading centers on the relative importance of L2 knowledge and L2 processing versus L1 reading abilities. The Language Threshold Hypothesis, as proposed by researchers, states that L2 language knowledge is more important than L1 reading abilities up to some point at which the learner has enough L2 knowledge to read reasonably fluently. Although there are a number of qualifications, this hypothesis has been strongly supported by recent L2 reading research. A number of studies have demonstrated the greater importance of L2 linguistic knowledge (than L1 reading knowledge) for students in varying contexts (Alderson, Nieminen, & Huhta, 2016; Jeon & Yamashita, 2014; Melby-Verlåg & Verlåg, 2014; Pae, 2019; Yamashita & Shiotsu, 2017; see also Chapter 4, this volume).

Concept 2.3: Language Threshold Hypothesis

The *Language Threshold Hypothesis* states that L2 readers need to know enough L2 knowledge (vocabulary and structure) so that L1 reading strategies and skills can be used efficiently to help comprehend the L2 text. If

> the reader is devoting most of his cognitive resources to figuring out the language of the L2 text, there are few cognitive resources left over for the fluent comprehension processes that would normally support the L1 reader. Readers usually cross the threshold whenever they encounter L2 texts in which they know almost all of the words and can process the text fluently. Because L2 readers are all different in their L2 knowledge, topic knowledge, and L2 reading experiences, there is no one level of general language proficiency that counts as the threshold for all readers or for all texts. The threshold will vary depending on the reader, text difficulty, topic, and, in some cases, the task.

Critics of this hypothesis have argued that there is no single set of linguistic knowledge that can be defined as presenting the necessary foundation (or the threshold). However, this objection does not represent a strong criticism because reading success and text difficulty are always determined by multiple factors. A given text may be too difficult to read because of its linguistic demands, but it also might be too hard to read fluently because of a new topic, poor organization, or insufficient time to read. The idea behind the linguistic threshold is not that there is a fixed set of language knowledge that students need. Rather, a variable amount of linguistic knowledge, combined with fluency of processing, is needed to read a specific text, on a specific topic, for a specific task. Students can be said to pass above the threshold (perhaps only temporarily for one specific text) when they have enough linguistic knowledge to read the text without encountering significant lexical and grammatical difficulty. As students are able to read increasing numbers of texts fluently, one can say that they are moving beyond the linguistic threshold, yet any new and difficult text might throw them back to a level of less fluent and inefficient reading (Alderson et al., 2015).

One major consequence of passing through the linguistic threshold is that students free up cognitive resources, which were previously used to figure out language structures and vocabulary, to read more strategically and transfer L1 strategic reading practices to the L2 setting. This hypothesis makes a strong argument for providing students with a lot of reading practice, focusing on both fluency and texts that are not too difficult.

It is also true, based on many studies, that L1 reading abilities have some role in L2 reading comprehension, whether due to different student proficiency levels, different L1–L2s being compared, or different types of measures and reading texts being used. However, these impacts are typically much less important in comparison with multiple L2 language abilities. In Jeon and Yamashita's (2014) meta-analysis of factors influencing L2 reading comprehension, all of the following L2 language factors had stronger relations with L2 reading comprehension than did L1 reading abilities: L2 vocabulary, grammar, morphological knowledge,

decoding, and listening comprehension (see also Mancilla-Martinez & Lesaux, 2010, 2017; Chapter 4, this volume).

One likely source for L1 and L2 reading correlations is the fairly large set of underlying cognitive processing abilities that are shared by all humans. Learning to read, as a complex cognitive skill, uses all of the same cognitive learning resources that we use for learning any complex skill; there is no difference with language learning or learning to read. Underlying cognitive processes and skills include working memory, background knowledge, speed of processing, and implicit statistical learning, among others (see Concept 1.4; see also Alderson, Nieminen, & Huhta, 2016; Eysenck & Keane, 2015; Geva & Ramirez, 2015).

Quote 2.4

> It is often asserted that L1 reading ability transfers to Second or Foreign Language (SFL) reading and that the reason why some readers have problems with SFL reading is because they are poor readers in their L1. The solution to the problem, it is argued, is to improve one's L1 reading so that transfer can take place. However, most SFL research into this question has shown the SFL reading is more of a language problem than a reading problem, and that there is a 'threshold' of SFL proficiency that a reader has to reach and surpass, beyond which L1 reading can transfer to the SFL and to some extent can compensate for gaps in SFL knowledge, but below which SFL knowledge is essential.
>
> Alderson et al. (2015, pp. 70–71)

2.1.5 Varying Language Transfer Influences

A natural extension of the **Language Threshold Hypothesis** is the more general issue of transfer to the L2. An initial issue in discussing transfer, and one that is sometimes downplayed, is that L1 knowledge transfer (including background knowledge learned in the L1) to L2 reading may facilitate comprehension, but it may also interfere with comprehension (Geva & Ramirez, 2015; Hipfner-Boucher & Chen, 2016). A second major issue for transfer involves transfer of basic reading purposes (see Chapter 1) and (meta)cognitive knowledge, the latter including strategies, inferences, motivation, attitudes, and L1 knowledge awareness. To the extent that reader purpose and various cognitive skills underlie all reading abilities across languages, they should be facilitative, but they are not specifically cases of L1 to L2 transfer; instead, they reflect language-independent cognitive abilities (Geva, 2016; Geva & Ramirez, 2015).

Quote 2.5

> At times L1 and L2 reading skills correlate not because of transfer of skills but because these reading skills rely on cognitive processing resources that are activated automatically

> whether one reads in the L1 or L2. Examples of such common underlying cognitive processing resources include working memory, executive function, phonological awareness, and the ability to access information in memory quickly and efficiently.
>
> Geva and Ramirez (2015, p. 56)

Transfer as interference is typically assumed to influence beginning and intermediate levels of L2 reading. When L2 students are asked to read material that is difficult for them, they rely on any resources available to try to make sense of the text. (Refer to the discussion of the situation model in Chapter 1.) At beginning L2 levels, students' strongest resources are their L1 language abilities, L1 reading abilities, and knowledge of the world. At times, these resources provide enough support to carry out certain comprehension tasks; at other times, these same resources can mislead students or slow L2 processing routines. In this latter situation, it is important to recognize that such interference is both natural and strategic on the part of students (and L1 resources are always active to some extent for the L2 reader). The instructional goal at lower levels is for students to develop enough vocabulary, reading practice, and processing fluency in the L2 so that they rely less on L1 resources that might interfere. Of course, one of the best ways to move beyond heavy L1 interference in L2 reading is to be sure that students are not always reading texts that are too difficult for them; students should be given sufficient opportunities to read texts that are easy to read and enjoyable. (See Nassaji, 2014, for discussion of extensive reading and language transfer.)

A different aspect of interference is likely to persist for much longer periods and may require consistent and direct teacher intervention, even at advanced reading levels. Students may not be aware of the varying purposes for reading called upon in L2 settings, particularly in academic settings. They may still be making assumptions about the uses of reading that are appropriate to their L1 experiences but not as appropriate for some L2 reading purposes. These assumptions may also be influenced by different motivations for reading and different attitudes toward reading. To minimize these types of interference, it is important to work with students to explore goals for L2 reading, appropriate strategies for completing L2 reading tasks, and inferences that connect background knowledge to text information.

Positive transfer effects, on the other hand, represent valuable resources for L2 reading development. In the right circumstances, many aspects of L1 reading abilities support L2 comprehension, though this transfer typically assumes well-developed literacy abilities in the student's L1 as well as strong L2 language abilities. Examples of positive transfer effects include the following: L1 phonological and orthographic knowledge, effective strategies for reading academic texts, appropriate purposes for reading, experiences with successful task completion, flexibility in monitoring comprehension, and skills for analyzing and learning new words. Positive transfer effects provide a means for accelerated

development of L2 reading abilities when they are assisted by instruction and teacher guidance.

Concept 2.4: Transfer in L2 Reading

Transfer refers to the idea that L2 readers will draw on their L1 knowledge and experiences to help them carry out L2 tasks. In the case of reading, transfer applies to a variety of language knowledge bases and cognitive abilities. Transfer can occur, for example, with phonological knowledge, morphological knowledge, topical knowledge, general background knowledge, problem-solving strategies, and inferencing skills. The concept of transfer usually emphasizes issues of linguistic transfer. We also tend to transfer our prior experiences to tasks of various sorts, including academic tasks that involve reading L2 texts. Sometimes transfer supports reading tasks, but sometimes it interferes with successful task completion. Transfer is also discussed more generally in educational psychology in terms of transfer of learning new skills. Transfer in this broader context is usually seen as problematic in that skill learning in one context is difficult to transfer immediately to new contexts and situations (see Quotes 2.5–2.7).

A popular notion in language teaching is that "skills transfer" is uniformly good and an easily accessible resource for L2 students. Very little evidence actually exists for these views, and there is now much evidence that such perspectives are simplistic and at times counterproductive (J. R. Anderson, 2015; Baddeley, Eysenck, & Anderson, 2015; Schunk, 2000; Urquhart & Weir, 1998). Aside from numerous studies documenting interference from L1 resources, there is growing evidence—from Language Threshold research and strategy research—that skills transfer is not uniformly automatic. One important consequence is the need to explore which L1 skills and strategies might be more or less automatically transferred, which might be positive supports for L2 reading development, and how positive skills and strategies might be reinforced through direct instruction in, for example, word-recognition skills, vocabulary-learning strategies, cognate use, and comprehension strategies.

Quote 2.6

> There is often failure to transfer skills to similar domains and virtually no transfer to very different domains.
>
> J. R. Anderson (2015, p. 231)

Quote 2.7

> The literature on transfer tends to be pessimistic. [L.] Mikulecky (1990) claims that a major misconception in literacy studies is that "mastering literacy in one context substantially transfers to other contexts," and adds, "Transfer of literacy abilities is severely limited by differences in format, social support networks, and required background information as one moves from context to context" (p. 25).
>
> Urquhart and Weir (1998, p. 3)

2.1.6 Interacting Influence of Working with Two Languages

Closely related to transfer discussions is the very fact that two languages are involved in L2 comprehension processes. The inevitable interplay between two languages in L2 reading influences word recognition, reading rate, the organization of the lexicon, the speed of syntactic processing, strategies for comprehension, experiences in task performance, expectations of success and failure, motivations for reading, and a number of other possible points of interaction. The potentially broad scope of this interplay is seldom discussed, perhaps because there is relatively little research that focuses specifically on these points apart from phonological and orthographic similarities across languages (Geva, 2016; Koda, 2016). However, this issue may become more important as more research is reported on cognitive processing in bilingual individuals and as research on discourse comprehension increases in the field of psychology (Chen, Dronjic, & Helms-Park, 2016; Zaretsky & Schwartz, 2016).

The issue of two languages working at the same time also suggests a range of non-linguistic factors that distinguish L1 and L2 reading comprehension. A number of these factors are simply not available to the L1 reader who is essentially monolingual. For example, L2 learners will have prior educational experiences in both languages that may impact their responses to reading instruction. L2 learners will have background knowledge that may be tied more to one language or the other. L2 learners will have underlying processing experiences because of cross-language attention shifting skills. These experiences are unique to L2 learners and are discussed in the next section of the chapter.

2.2 Individual and Experiential Differences between L1 and L2 Readers

In addition to the aforementioned six linguistic and processing differences, further distinctions exist between L1 and L2 reading. A number of these differences center around other resources and experiences that influence L2 reading comprehension, including students' proficiency levels in L1 literacy skills, their prior L2 reading experiences, their differing personal experiences with and motivations

Table 2.2 Individual and Experiential Differences between L1 and L2 Readers

1. Differing levels of L1 reading abilities
2. Differing motivations for reading in the L2
3. Differing amounts of exposure to L2 reading
4. Differing kinds of texts in L2 contexts
5. Differing language resources for L2 readers

for L1 and L2 reading, their attitudes toward authentic texts, and their training in the use of various supporting resources (see Table 2.2).

2.2.1 Differing Levels of L1 Reading Abilities

An important L1–L2 difference is that L2 readers are influenced by their levels of L1 reading abilities. In one respect, this point could have been made in earlier discussions of transfer; students who are weak in L1 literacy abilities cannot be expected to transfer many supporting resources to L2 reading contexts. The types of abilities and strategic processing that students use in their L1 reading likely represent the upper limit of what can be expected for linguistic transfer, strategic practices, problem-solving abilities, task-completion skills, and metacognitive awareness of reading processes. These are all skills and resources that can influence L2 reading, but only if they are already developed as L1 reading abilities or if the L2 reading skills develop beyond the person's L1 reading proficiency. (This often happens when a person does advanced academic study in a second language.) All too often, teachers and researchers do not carefully examine their students' L1 reading abilities or find some way to understand better the extent of students' L1 reading proficiency. Without such knowledge, we are more limited in deciding what skills and strategies to focus on and promote for transfer.

2.2.2 Differing Motivations for Reading in the L2

When comparing L1 and L2 reading contexts, it is likely that we will find different individual motivations for reading, as well as differing senses of self-esteem, interest, involvement with reading, and emotional responses to reading. The issue may not be more or less motivation to learn but rather the intersection of different kinds of motivation (e.g., intrinsic motivation, self-efficacy, expectancy-value motivation, extrinsic motivation) and different reasons or needs for developing reading abilities. For example, for advanced L2 students in university settings, extrinsic motivations may not be a negative factor hindering reading achievement.

As students progress through different levels of education, and as academic-task demands increase, L2 students tend to have differing (and perhaps more conflicting) combinations of motivations for reading L2 texts. Some of these differences in motivation are based on varying academic goals, socialization practices from home and community, prior educational instruction, or broad cultural

frameworks for literacy uses. These possible differences should be explored in classroom settings (e.g., through discussions, student-interest surveys, simple surveys of parents and community members, parent–teacher conferences, and family literacy projects). This information may help us understand student strengths and weaknesses beyond any language assessment measure and may lead to more effective instruction (see Dörnyei & Ushioda, 2011).

Aside from specific motivations for reading and task performance, students bring with them varying underlying attitudes toward L2 reading, which are often linked to perspectives on past educational experiences in both L1 and L2 contexts and to socio-political differences between L1 and L2 societies. These experiences shape perceptions of how well L2 readers can perform tasks and lead to student self-perceptions of how successful they are as students (and readers). These perceptions, in turn, influence students' self-esteem, emotional responses to reading, interest in reading, and willingness to engage in reading activities. No one disputes the fact that students' self-perceptions, emotional attitudes toward reading, interest in specific topics, and willingness to read texts and learn from them are important issues for the classroom learning environment. Unfortunately, these issues are often ignored in discussions of L2 reading comprehension instruction, but in L1 reading research some of these motivational issues are now seen as important predictors of academic success (Guthrie, Klauda, & Ho, 2013; Guthrie & Taboada Barber, 2019; Schwanenflugel & Knapp, 2016). L2 teachers are also not often given much guidance on these issues (cf. Dörnyei & Ushioda, 2011; Newton et al. 2018), so reading motivation and its various manifestations represent an important topic for L2 teacher research and classroom exploration. (See Model Action Research Project 8.1.2, focused on building student **motivation for reading**, in Chapter 8.)

2.2.3 Differing Amounts of Exposure to L2 Reading

A major difference for L2 reading, and one that strongly influences the linguistic knowledge differences mentioned in Section 2.1, is the total amount of exposure to L2 reading and to L2 print that a student experiences. In many cases, the extent of reading practice in the L2 will mark the typical L2 reader as different from the L1 reader. As we emphasized in Chapter 1, the development of fluency and automaticity in word and syntactic processing is an essential foundation for reading. Most L2 readers are simply not exposed to enough L2 print (through reading) to build fluent L2 processing (Beglar & Hunt, 2014; Chang, 2012; Nassaji, 2014). Nor do they have enough exposure to build a large recognition vocabulary (Andrews & Reynolds, 2013). These differences between L1 and L2 reading situations are significant because L1 readers spend years building up the amount of exposure to print needed to develop fluency and automaticity. The extent of students' exposure to L2 print is an issue that we can (and should) explore with our students to understand better just how much L2 reading practice students have had and what types of reading practice and L2 texts they have been exposed to (Seidenberg, 2017).

Quote 2.8

> Reading expands one's knowledge of language and the world in ways that increase reading skill, making it easier and more enjoyable to read. Increases in reading skill make it easier to consume the texts that feed this learning machinery. This feedback loop is the mechanism that leads to expertise.
>
> Seidenberg (2017, p. 83)

2.2.4 Differing Kinds of Texts in L2 Contexts

The experiences that individual students have with differing kinds of texts in L1 and L2 contexts are additional potential sources of reading comprehension differences. Because L1 and L2 readers are likely to have different experiences with various text genres, they develop diverse approaches to the range of texts that they encounter. In many L2 contexts, students read quite simple texts, yet in other L2 contexts students read texts far more difficult than they should be encountering. In the cases of the simpler texts (as in certain L2 reading textbooks and graded readers), these reading experiences may not match the reading experiences of L1 readers at comparable cognitive-ability levels. In settings where L2 students are asked to read difficult, often authentic, texts, reading experiences at first glance appear to be similar to L1 students, but closer examination reveals that the texts are often much shorter in length, a recognition on the part of materials developers of the difficulties students are likely to have with authentic texts.

Over time, L2 students are also less likely to be exposed to the full range of text genres that are commonly read by L1 students, partly because a number of these genres are read outside of class or even outside of educational task requirements. Online reading and digital text types raise additional interesting questions that have not been addressed with respect to L2 learner exposure (Biber & Egbert, 2018). It is not obvious what impact these differences have on L2 students, except that the range of texts that they could be reading is generally restricted (and new vocabulary exposure may be more limited as a result; cf. Gardner, 2013).

2.2.5 Differing Language Resources for L2 Readers

Important L1–L2 differences center on the use of bilingual dictionaries, glosses, translation, and cultural background resources in L2 contexts but not in L1 contexts. Bilingual dictionaries are, by definition, unique to L2 reading. L2 students often use learner dictionaries that carefully attend to the ways words are defined. More recently, L2 students commonly have word-translation apps on their mobile phones and often use online dictionaries for L2 to L1 translations. Neither of these resources is typical of L1 literacy learning. L2 students often read materials with glosses for more difficult terms. It is true that glosses are also found in L1 textbooks (e.g., in science-learning textbooks that often require extensive

technical vocabulary development), but they most often assist readers with unusual vocabulary, technical terms, or archaic words. In L2 contexts, glosses commonly provide synonyms for vocabulary that is above learners' levels but well within the range of vocabulary knowledge expected of L1 readers. In addition, L2 students commonly write out translations of texts and do their own mental translations as ways to assist comprehension (Kern, 1994). Such translation resources are unique to L2 settings. Finally, L2 students can reference their own specific L1 cultural knowledge and text resources for L2 reading tasks (e.g., proverbs, special and sacred texts, and cultural narratives). How these resources influence L2 reading comprehension for different groups of readers is not well known; however, they indicate a clear difference between L1 and L2 readers, and they should be investigated in the classroom for insights that a teacher might gain.

Pointing out unique and distinct resources for L2 students is only part of the issue. We need to evaluate the effectiveness of these resources, and students need to be taught to use these resources efficiently. For example, effective teachers do not take an absolute stand on bilingual dictionary use because students are likely to use bilingual dictionaries no matter what is said, especially with the large increase in use of online bilingual dictionaries and word-translation apps. Rather, the issue becomes which bilingual dictionaries or online resources to use, when to use them, and how to use them effectively. If we "ban" bilingual dictionaries or online resources, we guarantee only that students will not receive the guidance needed to use them efficiently because we can be sure that students will use them on their own.

2.3 Socio-Cultural and Institutional Differences Influencing L1 and L2 Reading Development

Aside from specific individual differences, linguistic and otherwise, a number of larger cultural and social issues operate outside of the specific classroom context (see Table 2.3). Reading development and reading instruction are strongly influenced by parental and community attitudes toward reading and uses of literacy. This is true for both L1 and L2 contexts. As will become apparent in this section, though, these factors do not always operate in the same way—either between L1 and L2 contexts or across various L2 contexts.

2.3.1 Differing Socio-Cultural Backgrounds of L2 Readers

A key difference between L1 and L2 reading settings, but one often overlooked, relates to the L1 socialization to literacy practices that L2 students bring from

Table 2.3 Socio-cultural and Institutional Differences Influencing L1 and L2 Reading Development

1. Differing socio-cultural backgrounds of L2 readers
2. Differing ways of organizing discourse and texts
3. Differing expectations of L2 educational institutions
4. Differing access to and training with digital texts

their L1 literacy backgrounds. In some cultures, literacy is relatively uncommon, and written communication is often limited to texting and other online apps. Other cultures use literacy extensively but emphasize certain uses over others, often placing greater value on sacred texts or other highly valued traditional texts or, in reverse, on brief online interactions. Yet other societies use literacy extensively, despite the fact that individual limitations in literacy skills are common and socially accepted. Finally, other societies socialize citizens (and newcomers) to believe that everyone should be literate. In such settings, the literacy environment is intense and pervasive (i.e., signage, labels, and texts of all types are found everywhere, in both print and digital forms) (Alderson, 2000).

Quote 2.9

> What it means to be literate, how this literacy is valued, used and displayed, will vary from culture to culture. Some cultures have enormous respect for the printed word, such that it is implicitly accepted as authority, and cannot be questioned. Others fear the implications of putting any opinions in print, since the greater permanence accorded to opinions thereby makes the owner of the opinion more "accountable."
>
> Alderson (2000, p. 25)

In each cultural context, assumptions about how to use text resources, including technology resources, also tend to vary (Cobb, 2017; Jones, 2017). Some social groups see texts as unchanging; others consider texts as serving utilitarian purposes but not to be highly valued; others view texts as sources of truth to be studied; yet others value texts as alternative interpretations of realities and facts that can be disputed. In each setting, individuals are socialized in their L1 education to engage with texts in specified ways (Haeri, 2009). L2 readers moving from one orientation to another are likely to encounter some difficulties in reading texts for purposes that do not complement cultural assumptions; these students may need teacher assistance in making these shifts. In almost all cases, L2 students will have some difficulties framing assumptions presented in L2 texts when these texts make use of cultural assumptions that the L2 students do not share. These mismatches in assumptions may cause serious problems when L2 students read literary and contemporary-culture texts.

2.3.2 Differing Ways of Organizing Discourse and Texts

Another major distinction between L1 and L2 reading contexts is the differing cultural and social preferences given to particular ways of organizing discourse and texts. In literate societies around the world, people develop preferred ways of organizing information in written texts (and also in oral texts for that matter). For example, people make arguments in writing by presenting observational and numerical evidence, by emphasizing a culturally accepted logic, by pointing to a persuasive example, or by referring to traditional wisdom or religious

doctrines. Certain socio-cultural preferences for making an argument or taking a position then tend to become conventionalized in writing so that the structures and organizational plans for writing tend to reflect an expected way to present an argument. Thus, purposes for writing, beliefs about the preferred ways to make an argument, and the ways information is used in writing all influence how texts may be organized and how linguistic resources are employed. The study of this phenomenon is sometimes referred to as contrastive rhetoric or intercultural rhetoric (Connor, 2011). The essential point for the purposes of reading is that L2 text resources may not always be organized in ways that match students' L1 reading experiences.

Additional factors related to text organization that may influence L2 reading comprehension center on differences in (a) the ways texts express interpersonal relations with the reader (e.g., the use of "I" and "you" as pronouns), (b) expectations about the amount of new information that is embedded in a text (e.g., the use of many nominalizations), (c) assumptions about how explicitly reader interpretation should be guided (e.g., with supporting details, descriptions, and explanations), and (d) the ways that more relaxed writing in online communications intersect with more formal genres. These issues suggest the benefits of exploring the discourse organization of texts as part of instruction and raising student awareness of the ways in which information is presented (or not presented), all the while being cautious with certain over-generalized claims about discourse differences across languages. Yet another potentially major factor involves the mixed genre and mixed media input students may receive from the Internet. How will L2 students read and use multimedia materials for learning purposes if they have little supporting experience? Alternatively, how will L2 students navigate extended print-based reading material if they are receiving most of their L2 exposure through the Web (Cobb, 2017; cf. Jones, 2017)? (See Model Action Research Projects 8.1.4 and 8.1.5, focusing on elements of discourse structure awareness, in Chapter 8.)

Quote 2.10

> The basic problem is that fully linked, mixed-quality, non-linear documents provide mainly distraction and overload rather than breadth of information, and far more of it than people can actually cope with. The problem is particularly pointed for those who have little previous experience with 'real' (paper) texts, such as children, now renamed 'digital natives,' or second language learners, who are meeting their new languages through digital texts.
>
> Cobb (2017, p. 313)

2.3.3 Differing Expectations of L2 Educational Institutions

A further distinction between L1 and L2 reading is shaped by the different attitudes, resources, and expectations of L1 and L2 educational structures. L2

students are shaped in their assumptions and their performances by their previous L1 institutional experiences (with, for example, national exams, national curricula, teacher behavior, classroom management, instructional resources, teacher inspectors, and district and regional mandates), which could be in sharp contrast with the L2 institutional settings in which they find themselves (Johns, 2009). Additional differences include amounts of funding for teacher training, levels of teacher experience, allocations of money to educational resources, level of support for educational infrastructure, teacher–student relationships, and class sizes. Of course, these differences can be found within L1 contexts, with ethnic minority groups often experiencing lower levels of institutional support. However, these differences may be magnified considerably with L2 students from many different socio-cultural and language backgrounds, and these differences can lead to reading difficulties that might otherwise be unexpected (Schwanenflugel & Knapp, 2016).

In line with this issue are the differences that stem from group socialization to the usefulness (or non-usefulness) of institutional structures generally and, on many occasions, the potential oppressiveness of these institutional structures more specifically. In L1 contexts, ethnic minorities often see school institutions as representing interests at odds with their own, and they tend to develop resistant attitudes toward mainstream educational efforts (Li, 2011; Rodríguez-Brown, 2011). At a general level, these socio-cultural background factors will often be compounded by, for example, different family socio-economic levels, patterns of home literacy support, parental education, and numbers of books in the home. These factors are particularly important among immigrant families and ethnic/language minority groups required to read in the majority language or dialect of the educational system (Netten, Luyton, Droop, & Verhoeven, 2016; Rueda, Unrau, & Son, 2015; Washington, Terry, & Seidenberg, 2014).

In L2 contexts, students may bring strong attitudes from the L1 to the L2, with little room to accept the L2 as a relatively utilitarian tool for further learning. At the same time, many L2 students do adopt a strongly utilitarian attitude toward the L2, an attitude that may be quite different from their attitudes toward their L1s. A utilitarian attitude may, in turn, limit students' willingness to engage in a long-term consistent effort to learn to read fluently.

2.3.4 Differing Access to and Training in Reading Digital Texts Effectively

As the entire world becomes more deeply immersed in reading digital resources, an obvious issue to be raised is the extent to which L1 and L2 students have different or similar experiences in engaging digital texts of various types. At one level, an entire chapter could be written cataloging the many different types of digital research now available. On another level, there is very little research on the differing experiences of L1 and L2 readers as they interact with digital texts, especially when this exploration moves beyond social media reading sources. It is true that almost all students, L1 and L2, have access to digital resources through mobile phone technology. There are also many examples describing how to use

digital text resources for L2 reading (and vocabulary) development. Most of these examples describe how to use (a) hyperlinked texts with links to background information, (b) texts with visual media support, or (c) texts that give choices for reading additional text materials. Alternatively, several options for instructional programs with online texts amount to placing print text materials into an online format. Simply transferring print material to an online platform can allow for wider educational outreach, but it is not likely to generate more productive instructional outcomes, and perhaps no differences between L1 and L2 reading development. Through all of these permutations, there is relatively little reliable research evidence that online resources or instruction produces significant benefits (though they can generate major challenges).

For purposes of reviewing L1 versus L2 differences in digital reading (and digital reading instruction), there is very little research exploration. Certainly, educational contexts influence possible differences, with better resourced environments providing more opportunities to use digital texts for reading development, but there are some L2 contexts that are better resourced than L1 contexts for reading development. It is also difficult to explore digital resources and text (types) as sources of L1 versus L2 difference because they are evolving so rapidly. This sub-section simply notes the role of online resources and digital texts as foci of reading development that may intersect with L1 versus L2 reading development. Any claims at this point can be only speculative. (For introductory reviews of the use of online resources, see Barzillai, Thomson, Schroeder, & van den Broek, 2018; Cobb, 2017; Park & Warschauer, 2016; Spiro et al., 2015; Zawilinsky, Forzani, Timbrell, & Leu, 2019.)

2.4 Similarities between L1 and L2 Reading

Despite the many differences that exist between L1 and L2 reading, whether they are linguistic, cognitive, or sociocultural, there are still several reasons L2 readers learn to move beyond most, if not all, of these differences depending on the level of L2 reading proficiency to be achieved. First, and most important, L1 and L2 reading abilities share almost all of the same component skills, and the reading construct is very similar in terms of underlying cognitive and linguistic components (Nassaji, 2014; Verhoeven, 2017). For example, word recognition, vocabulary knowledge, morphological knowledge, syntactic knowledge, and world knowledge all work in the same ways to achieve comprehension. Challenging texts require abilities that are strategic, and the strategies for advanced academic or professional reading tend to be the same across languages. Moreover, the many underlying cognitive skills used by readers are the same for L1 and L2 reading. Perhaps the greatest ongoing challenge is represented by socio-cultural differences, but the mechanisms of learning to read in the L1 and L2 are actually remarkably similar.

From cognitive and experiential perspectives, we know that L1 and L2 reading differences center, either directly or indirectly, on the linguistic resources that a L2 reader can bring to bear on text comprehension. However, the L2 linguistic

resources can be developed to the point that L1 and L2 reading skills are essentially the same (Verhoeven, 2017). Similarly, L2 readers have less experience reading in the L2, but that difference can be mitigated as L2 readers engage in extensive amounts of reading (Seidenberg, 2017). Also, the fact that reading always involves two languages does not prevent L2 readers from automatizing many of the L2 reading skills required for fluent reading; again, this is a matter of time, reading experience, and motivation. The same factors of time, experience, and motivation overcome transfer difficulties that are obvious at lower levels of L2 reading ability. Reading extensively also minimizes differences in L1 versus L2 world and topical knowledge. So, while beginning and intermediate L2 reading abilities are more distinct from L1 reading, with more skilled L2 readers, the reading processes involved become more similar. As L2 readers become skilled in reading more challenging texts, the higher-level skills related to academic comprehension skills generally are no longer constrained by what may once have been limited amounts of linguistic knowledge, and they can fully transfer from the L1 to the L2, or the reverse.

If we can recall the discussion in Chapter 1 of the miracle of reading, we need only to look at the many people who have become skilled readers in their L1 and who have also become similarly skilled readers in their L2 and possibly additional languages. In short, we can consider many factors that create different challenges for L2 readers, but all of these challenges can be overcome in supportive, appropriate environments through reading in the L2.

Quote 2.11

> The serious way to improve reading—how well we comprehend a text and yes, speed and efficiency—is this: Read. As much as possible. Mostly new stuff.
>
> Seidenberg (2017, p. 82)

2.5 Conclusion

The many differences that exist between L1 and L2 reading contexts point out the complexities of L2 reading comprehension. (See Table 2.4 for a summary of differences.) L2 students and student groups are not only as diverse as L1 student groups, but are also involved in learning goals that are even more complicated than those in most L1 literacy environments. Many of the assumptions typically associated with L2 reading instruction should be rethought and modified in light of these differences. On the basis of this chapter, it should also be apparent that there is no straightforward blueprint for how a teacher should adapt instruction for all L2 contexts. Teachers must learn to provide appropriate support for students' reading-skill development, design effective practice opportunities to help students develop key reading processes, and offer guidance for an extended period of time. It is also clear that no one-size-fits-all approach or set of procedures is suitable for all L2 students with reading-skill development aims.

Table 2.4 Differences between L1 and L2 Reading

Linguistic and processing differences

1. Differing amounts of lexical, grammatical, and discourse knowledge at initial stages of L1 and L2 reading
2. Greater metalinguistic and metacognitive awareness in L2 settings
3. Varying linguistic differences across any two languages
4. Varying L2 proficiencies as a foundation for L2 reading
5. Varying language transfer influences
6. Interacting influence of working with two languages

Individual and experiential differences

7. Differing levels of L1 reading abilities
8. Differing motivations for reading in the L2
9. Differing amounts of exposure to L2 reading
10. Differing kinds of texts in L2 contexts
11. Differing language resources for L2 readers

Socio-cultural and institutional differences

12. Differing socio-cultural backgrounds of L2 readers
13. Differing ways of organizing discourse and texts
14. Differing expectations of L2 educational institutions
15. Differing access to and training with digital texts

If there is one critical lesson that has emerged in the past decade of L2 reading research, it is that the L2 reader is not simply a reader in contrast with the L1 reader. Instead, current L2 research suggests that the L2 reader is one who incorporates both L1 and L2 language and literacy knowledge. Such a perspective opens up more careful explorations of L2 reading processes, the role of L1 transfer, the development and use of the bilingual lexicon, and the strengthening impact of L2 knowledge as the L2 reader develops. This view is captured well in Quote 2.12 by Koda (2008).

Quote 2.12

> Dual-language involvement is the foremost attribute highlighting the unique characteristic of second-language reading. A clearer understanding of how literacy experiences in two languages interact and coalesce in the formation of second-language reading skills should take primacy in second language reading research.
>
> Koda (2008, p. 90)

Becoming informed about the many possible differences between L1 and L2 students can assist all of us in (a) interpreting reading research and the many assertions made about effective reading instruction, (b) recognizing the particular demands of L2 reading, and (c) investigating pertinent concerns in our own classrooms. At the same time, we cannot wait for sweeping assertions from research, nor should we be swayed by claims of "perfect" classroom solutions. Rather, we should use our own classrooms, and our own students, as a forum for meaningful

classroom-based research. Real classroom environments often provide the best context for exploring L2 learning issues important for effective learning. The differences showcased in this chapter represent useful starting points for meaningful and purposeful teacher-initiated inquiry, as shall be illustrated in Part IV of this volume.

But before considering how teachers can engage in their own action research, we provide an introduction to current research on reading in both L1 and L2 contexts in Part II of the volume. We begin by viewing research studies as types of stories. Just like every well-formed story, each study has a setting, a set of episodes, a culminating event, and a moral for the reader. We then tell 10 good stories about L1 reading research (Chapter 3) and 10 good stories about L2 reading research (Chapter 4). In telling these stories, we introduce our readers to interesting research efforts by some leading researchers, highlight key components of reading comprehension, and illustrate a range of ways that good reading research is being carried out in L1 and L2 contexts.

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. These additional citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Interplay between two (or more) languages in reading*, see Chen, Dronjic, and Helms-Park (2016), Hulstijn (2015b), Koda (2007), Wen, Mota, and McNeil (2015).
- *Use of different L2-specific resources to facilitate reading*, see Hedgcock and Ferris (2018), Nation (2009).
- *Cultural and social issues related to reading*, see Domínguez and Gutiérrez (2019), García (2014).

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Part II

Exploring Research in Reading

> [Lexical quality assumes that] word knowledge is acquired over time through repeated experiences with words. According to this view, individual differences in reading skill arise from differences in word knowledge, which in turn arise from differences in word experiences.
>
> Reichle and Perfetti (2003, p. 231)

> Substantial reading comprehension practice and exposure to print [are] crucial in the development of reading comprehension skills and acquisition of vocabulary.
>
> Oakhill and Cain (2017, p. 369)

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3 Key Studies in L1 Reading

This chapter showcases a good story and 10 L1 reading research studies that make major contributions to our understanding of reading and learning. The studies are explained in easy-to-understand terms to show how and why researchers carry out their research and how results are interpreted. In the 2nd edition of this book (2011), we focused our review of seminal L1 studies mainly on vocabulary development, reading fluency, and strategy learning.[1] In this 3rd edition, we focus on a few more recently developing predictors of reading development as well as updating research on component linguistic variables (e.g., word recognition, vocabulary knowledge) and their impact on reading. A review of these studies will help practitioners understand important emerging aspects of reading research, including the following:

- The relationship between reading amount and reading abilities.
- The impact of underlying cognitive skills on reading development and reading abilities.
- The effects of vocabulary, syntax, and morphological knowledge on reading comprehension.
- The importance of discourse awareness and inferencing skills for reading comprehension.
- Various perspectives on the Simple View of Reading and Reading Systems Framework.
- Specific instructional practices for reading skills development.

Chapters 1 and 2 of this book outlined a theory of fluent reading and differences between first language (L1) and second language (L2) reading. Those introductory chapters highlight the fact that we know a lot about reading in general, but somewhat less about L2 reading and how best to teach L2 reading. Chapters 1 and 2 also illustrate the insights that as reading teachers we gain from understanding reading research and evaluating research studies and corresponding implications for instruction.

In this chapter and the next, we consider how research studies can be understood, how they can be interpreted, and how impactful research studies open up new ideas for teaching reading. Chapter 3 focuses on key L1 reading research;

Chapter 4 shifts the focus to L2 reading research. Particularly important in this chapter is the link between specific research efforts and the types of implications from research that lead to theory building and recommendations for instruction. (The latter is explored more in depth in Chapters 5 and 6.)

3.1 Research Studies as Stories: An Extended Example

Every research study, in essence, represents a story. We read stories almost every day and do not see them as difficult; in fact, we often think of reading stories as pleasurable. So why don't most of us think of reading a research study as pleasurable? Why don't we think of reading a series of research studies (by a single researcher or team of researchers) as chapters in a good novel? Certainly, the story structure of a research article is different from what we are used to in more conventional storytelling. A lack of familiarity with the many conventions of a research "story" sometimes makes it hard for us to follow the story line. Nevertheless, research studies are stories, and they contain features of story structures. Only the format and the formal reporting features are truly different, reflecting a different target audience and its set of well-defined expectations.

Usually, a researcher (the main character) pursues a good idea, gathers key background information, and poses a specific question (representing the challenge or "conflict" in the story). Before beginning the quest for an answer to the question, our main character engages in a series of preliminary steps (akin to a series of episodes), deciding what resources are needed, who will participate, how participants will be found, who has to agree to what, and finally how collected data will be examined to solve the problem or conflict. These episodes may be lengthy because each step may require a lot of time and effort and obstacles may be encountered along the way. The goal is to have all the pieces of the story in place before collecting data to answer the question (or resolve the "conflict"). Like a good story, each research study has its main characters, plot, intrigue, and resolution, though it is written up differently.

We start this chapter with a major story of an extended research effort beginning in the early to mid-1970s. This story comprises multiple episodes (and over 400 articles and books). This decades-long epic tale shows how a productive research agenda grows and transforms itself as new concepts and ideas are explored, linked to earlier ideas, and validated through research. Over numerous decades (and likely into the future), this story has had a major influence on L1 reading research; over the past 20 years or so, it has also significantly influenced L2 reading research.

This story—which could be thought of as an epic narrative that unfolds over a period of more than 40 years—begins with the early research of Charles Perfetti, a leading cognitive and educational psychologist. In the early to mid-1970s, Perfetti and his colleagues carried out a set of studies aimed to investigate how reading is an interactive process that emerges from several key component language abilities. Early on, Perfetti highlighted the importance of vocabulary knowledge for reading comprehension, and he examined in detail the relationships

among **phonological awareness**, **orthographic knowledge** (letters, word forms, and spelling ability), and semantic processing of words with young learners. He showed how these word recognition knowledge bases and processes (among other knowledge bases and processes) can cause difficulties (or pressure points) for reading comprehension. These pressure points arise at the levels of word recognition, word knowledge, syntactic processing, or text meaning development (see Lesgold & Perfetti, 1981; Perfetti & Adlof, 2012). These early studies demonstrated the importance of interactive processing among various component skills and the role of automatic processes in reading.

1985 and the publication of *Reading Ability*: The early research studies led to a groundbreaking book on reading research, *Reading Ability* (1985), in which Perfetti explained his model of reading, the Restrictive Interactive Model. This model synthesized the many studies that he and colleagues had carried out to hypothesize the interactions among many reading skills, combining automatic and strategic processing. The "restrictive" element of the model emphasizes two important characteristics of reading: (a) higher-level processing cannot operate smoothly for comprehension unless lower-level processes are automatized through large amounts of reading experience (or exposure to print); and (b) lower-level processing, as it becomes fully automatized, is no longer interactive because the processes operate too fast to be affected by higher-level processing. Only when lower-level processing does not operate automatically (or accurately) do difficulties arise; then the reader tries to make sense of the problem (or the pressure point in the comprehension process).

These insights continue to be key concepts for all current theories of reading abilities. Perfetti's Reading Systems Framework approach (introduced in Chapter 1 and explained in further detail below) was developed more than 25 years after his earliest model of reading. The framework represents the most current version of his lifelong quest to understand the nature of reading abilities.

Quote 3.1

> Most of the research on individual differences in reading comprehension has focused on higher-level components …. These higher-level processes are at work as the reader recognizes words, retrieves their context-appropriate meanings, and builds phrases (parsing) from words. Thus, they depend on operations of the lower-level components …. [This dependence] requires the assumption that lower-level processes are operating smoothly.
>
> Perfetti and Adlof (2012, p. 6)

Mid-1980s to late 1990s: During this time period, Perfetti explored many factors that contribute to reading abilities, including (a) automatic word recognition skills; (b) the roles of precise orthographic processing (including spelling), morphological knowledge, lexical knowledge, and syntax; (c) the role of discourse processing in developing main idea comprehension; and (d) comprehension and synthesis abilities across multiple texts, the latter leading to the

Documents Model of Reading (Perfetti, Rouet, & Britt, 1999). The Documents Model extended the roles of linguistic component abilities in reading, going from comprehension of a single text to the coherent synthesis of multiple texts on a topic. During this time, spelling was explored much more carefully as a source of reading difficulty (see Andrews, 2015; Ehri, 2014; Perfetti, Rieben, & Fayol, 1997). Perfetti also began a series of research studies on reading comprehension in Chinese and comparative studies of reading in Chinese and English. This research trajectory would lead eventually to research on universals of reading abilities across languages (Perfetti, 2003; Verhoeven & Perfetti, 2017b).

2000 to 2010: By 2000, Perfetti was building the foundation for a framework that would describe reading processes in greater detail. These processes would proceed from component linguistic skills involved in word recognition to lexical access supported by densely linked background knowledge (**Lexical Quality Hypothesis**) and to "word-to-text integration" as the process that links ideas together to form text-level comprehension (Perfetti, 1999; Perfetti, Stafura, & Adlof, 2013; Yang, Perfetti, & Schmalhofer, 2005). This expansion of reading research also led to a variation on Kintsch's (1998) text model and situation model as comprehension outcomes of various component linguistic processes. This linking of word recognition, lexical access, word-to-text integration, and the formation of a linguistically driven text representation and a situation model also led to an expanded view of pressure points that can create comprehension difficulties, including problems with inferencing abilities, comprehension monitoring, and goal setting (i.e., the standard of coherence) (Perfetti, Landi, & Oakhill, 2005). During this same time, Perfetti and colleagues also carried out several studies using neurolinguistic research methods to present new perspectives on reading comprehension processes (Liu, Perfetti, & Hart, 2003; Perfetti, Wlotko, & Hart, 2005; Schmalhofer & Perfetti, 2007).

The Lexical Quality Hypothesis: The importance of a strong knowledge of words in a reader's lexicon, going back to the beginning of Perfetti's career, was formalized as the Lexical Quality Hypothesis beginning in the early 2000s (Perfetti, 2007; Perfetti & Hart, 2001). The major innovation to this hypothesis was twofold:

1. Successful reading is largely dependent on high-quality word knowledge, in terms of both breadth and depth.
2. Problems in comprehension are often caused by ineffective, or not fully automated, word identification processes and resulting representations.

High lexical quality representations consist of three fully specified and very accurately processed constituents: the orthographic, phonological, and semantic specifications of the word. The orthographic representations are precise. The phonological representations, linked to orthographic representations, emerge through explicit teaching and reading experiences. The semantic representations include many rich associations to other word meanings and a high level of integration with the reader's background knowledge. Fully specified

and highly accurate word recognition emerges incrementally from extensive exposure to print over time and the automatization of lexical processing (Elgort et al., 2018; Reichle & Perfetti, 2003). Lexical quality, which grows word by word over time, can be associated with lexical depth. However, the purpose of the Lexical Quality Hypothesis is not to contrast lexical breadth and depth but instead to explain how reading development emerges as more and more words are expanded into higher-quality representations over time and how these words then become sight words for automatic access, including automatic associations to a wide range of other knowledge—lexical, syntactic, and discoursal (Landi, 2013).

Quote 3.2

> In the framework of the Lexical Quality Hypothesis …, more [reading] exposures to words increases the robustness and specificity of lexical representations, strengthens the connections between learned words and the reader's existing lexical and conceptual knowledge, and strengthens both form–form (orthography–phonology) and form–meaning connections of a word. These factors contribute to making the process of word identification faster and more accurate, enabling fluent comprehension.
>
> Taylor and Perfetti (2016, p. 1071)

One other feature of the Lexical Quality Hypothesis is central to explaining how so many words can be learned incidentally while reading. According to the Lexical Quality Hypothesis, skilled readers are at an advantage in having many high-quality word representations. These high-quality lexical entries, with extensively linked associations to other words, create well-defined spaces for new word forms with new associations to fit into rich networks of lexical items. Thus, a high-quality lexicon enhances new word learning, typically with fewer exposures to the new word form. This argument helps explain why learners with greater vocabulary knowledge learn new words more efficiently, particularly through incidental word learning while reading (Landauer, Kireyev, & Panaccione, 2011; Nation & Castles, 2017; Steacy, Elleman, & Compton, 2017).

Word-to-text integration: From 2000 onwards, Perfetti and colleagues have been working on making explicit many of the linkages that begin from a well-defined high-quality lexicon to the reader's understanding of a text. Word-to-text integration involves explicit identification of the roles of lexical access and semantic propositional formation as foundational input into generating the text representation and situational model of reading. Word-to-text integration does not specifically address syntactic parsing as a distinct process apart from lexical access. Perfetti's description of word-to-text integration also does not require extensive roles for inferencing skills, unlike other reading comprehension models. Instead, background knowledge supports the text representation and situation model by making automatic connections to the new information being read and the prior information in the text representation.

Quote 3.3

> We do not think that this integration [of new information into the text model] is necessarily an active process. It is at least partly (if not mainly) a memory-driven process, in which words from the recently read text and the propositions they encode (the text model) are highly accessible in memory. A word, as it is read, "resonates" with these memories, and connections are made without an active construction process.
>
> Stafura & Perfetti (2017b, p. 24)

As Quote 3.3 indicates, word-to-text integration often does not require extensive sets of inferences to generate text comprehension. This is a significant innovation of the word-to-text-integration process over older models. Perfetti and colleagues suggest that most linkages in building a text representation and a situation model are generated automatically as a result of implicit learning mechanisms (Perfetti & Stafura, 2015). Thus, the "linking" in word-to-text integration operates largely automatically through what Perfetti refers to as automatic "**paraphrasing" connections** and associational priming triggered by background knowledge (lexical association networks) (Perfetti & Stafura, 2015; Schmalhofer & Perfetti, 2007).

Quote 3.4

> For an expert reader with knowledge of word meanings and sufficient experience, [word-to-text integration] is not an effortful process. Indeed, each overlapping phase of integration can be executed with minimal resource demands, approaching automaticity.
>
> Stafura and Perfetti (2017, p. 25)

Reading Systems Framework: In the last decade, a more comprehensive synthesis of various research avenues has led Perfetti and colleagues to argue that no model of reading comprehension can, by itself, capture the many component language processes, knowledge resources, and underlying cognitive skills that contribute, in various and varying combinations, to reading comprehension (see Chapter 1). Perfetti and Stafura (2014) argue that explanations for the development of reading abilities, and the process of skilled reading, should be described somewhat more cautiously through their Reading Systems Framework (Figure 3.1). For Perfetti, proposing a flexible framework that can be adapted and improved through further research provides a strong mechanism for describing how reading comprehension works and offers persuasive implications for reading instruction and reading assessment.

The Reading Systems Framework not only specifies the development of a tightly integrated and precise word-recognition process but also proposes that the output of lexical access feeds the word-to-text-integration process (Perfetti & Stafura, 2014; Perfetti, Yang, & Schmalhofer, 2008). The

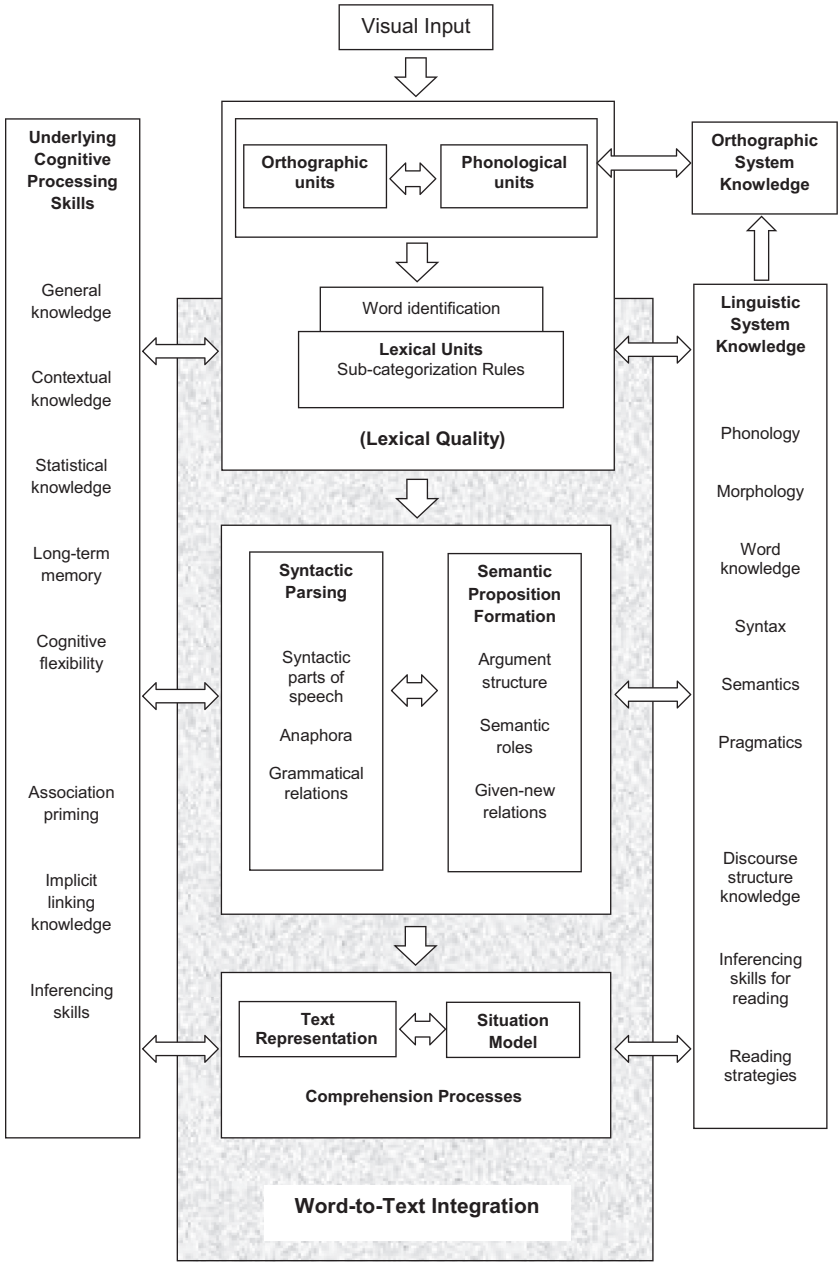


Figure 3.1 Reading Systems Framework (adapted from Perfetti & Stafura, 2014).

word-to-text-integration process begins with lexical information, including syntactic resources drawn directly from activated lexical items. Lexical activation (plus some form of recall of syntactic structures stored as units in long-term memory) then supports meaning proposition formation. The semantic propositions provide the meaning items to be linked into an ongoing overall set of highly active main ideas that are an emerging text representation of the text being read. Word-to-text integration argues that much of text representation development draws on rich lexical and syntactic information. This process of word-to-text integration extends aspects of the C-I and Landscape Models (Chapter 1) in terms of generating real-time comprehension, but not as a cognitively demanding process for the expert reader.

The point of this lengthy development of Perfetti's 40-year research agenda, and the arguments supporting the Reading Systems Framework, is that it forms a foundation for examining all facets of reading comprehension processing. The framework operates in ways that permit *causes* of poor comprehension to be explored within a flexible theoretical context. The framework itself can be expanded to incorporate new findings without harming overall conceptions of reading comprehension knowledge bases and processes. The framework provides a useful way to synthesize research results of many types into a manageable interpretation of how reading comprehension most likely works in most contexts. In effect, it provides a good roadmap for developing an inclusive construct of reading that can identify factors impacting reading comprehension, reading instruction, and reading assessment practices.

As one might imagine, the original story of Perfetti's epic journey, in its various segments (or episodes), was reported in a very different manner (in a very large number of journal articles) and explained in a condensed scientific way (as expected by other professional researchers). Together, the various studies tell a captivating story with Charles Perfetti as the "main character," who over decades continually sought new explanations and more refined answers to difficult questions (the conflicts). The story started with an idea—to explain the nature of reading comprehension. Then one by one specific questions were posed to study many different facets of reading abilities using different research methods.

In many instances, the proposed research required creating specific materials to collect data. Often, students needed to be recruited to do experimental tasks, and the tasks had to be carried out precisely in ways that did not cause unexpected errors in data collection. At other times, research labs had to be created to house equipment, and the labs had to be checked consistently to ensure efficient and accurate data collection. Consider all the hours and effort needed to do this successfully, and then think of all the people and resources that (a) contributed to the development of study after study and (b) ensured reliable and valid outcomes. As we reflect on all of these efforts, we can certainly see research as a "quest" narrative or possibly an epic narrative in this case. And when research is done well, and for public good, we can even think of researchers as heroes from time to time.

3.2 Ten More Key Research Studies

Most reading research shares similarities with Perfetti's research agenda. At the core, there is a straightforward motivation for telling these stories: a real concern; a good question; a way to collect information, often by means of teaching or testing with materials or technologies that are created or reused from other studies; and the means for reviewing and then interpreting results. What is not plainly visible in this simple sequence is the human side of the story. In the major story just told, Perfetti and colleagues engaged in a lot of thinking, brainstorming, planning, talking, persuading, and writing. In the same vein, every study that follows has required time to make sure it is done well and accurately, and without harm to participants. Throughout all of the studies, as will be seen, efforts have been made to come up with unique and innovative ways to observe, measure, and interpret reading abilities.

The "moral of the story" is that research can be an understandable process, even if certain details related to controls and statistics can seem overwhelming at times. In this section of the chapter, we highlight 10 other remarkable research stories (see Table 3.1). They were chosen for their contributions to the field of L1 reading and because they (a) address central questions about reading in L1 contexts, (b) focus on a number of distinct issues in reading, (c) reveal different ways to conduct research about reading, and (d) have important implications for reading instruction. In every case, the researchers have made important contributions to our understanding of reading and learning. (It is worth noting that the particular research discussed typically represents only one aspect of the researchers' contributions to the field.) Each study contributes real "food for thought" to practitioners who are interested in improving reading instruction in their classrooms.

One further comment on the 10 studies showcased is needed: many studies employ newer or more demanding research techniques, newer concepts impacting reading, and newer statistical procedures (e.g., better controls in their analyses, longitudinal studies, meta-analyses, structural equation modeling). It is inevitable that research advances include new ways to gain additional knowledge. The studies introduced here reflect these research advances while also bringing to light new information about reading abilities and new understandings about how reading "works."

3.3 Research on Underlying Cognitive Skills and the Impact of Extensive Reading

3.3.1 Print Exposure from Infancy to Early Adulthood: A Meta-Analysis

A current trend in reading comprehension research is the emphasis on reading experience and reading exposure to text. The amount of reading carried out by a student has a strong impact on many underlying cognitive skills and linguistic component skills that support reading comprehension (Nation & Castles, 2017; Reichle & Perfetti, 2003; Seidenberg, 2017; Verhoeven & Perfetti, 2017b). The

Table 3.1 Topics of L1 Research Studies Summarized in Chapter 3

Section	*Topics of selected L1 research studies*	*Researchers*
3.3 Research on underlying cognitive skills and the impact of extensive reading		
3.3.1	Print exposure from infancy to early adulthood: A meta-analysis	Mol & Bus (2011)
3.3.2	Early reading success and its relationship to reading achievement and reading volume	Sparks, Patton, & Murdoch (2014)
3.3.3	Statistical learning related to early literacy skills	Spencer, Kaschak, Jones, & Lonigan (2015)
3.3.4	Relationships among motivation, engagement, achievement and reading instruction,	Guthrie, Klauda, & Ho (2013)
3.4 Research on specific component skills in reading comprehension		
3.4.1	Vocabulary growth and reading development across elementary grades	Verhoeven, van Leeuwe, & Vermeer (2011)
3.4.2	Contributions of morphological knowledge to vocabulary and reading comprehension	Goodwin, Petscher, Carlisle, & Mitchell (2017)
3.4.3	Oral reading fluency and its impact on reading comprehension	Tighe & Schatschneider (2014)
3.4.4	Role of syntactic awareness in the development of reading abilities	Deacon & Kieffer (2018)
3.4.5	Effects of text-structure instruction on reading abilities: A meta-analysis	Hebert, Bohaty, Nelson, & Brown (2016); Also Pyle et al. (2017)
3.4.6	Impact of inference instruction on literal and inferential comprehension: A meta-analysis	Elleman (2017)

study by Mol and Bus (2011), reported here, emphasizes the critical role of exposure to print (amount of reading) for the development of reading comprehension skills and sub-skills as they develop from early childhood to early adulthood. Mol and Bus carried out a **meta-analysis** to examine the impact of amount of reading exposure on multiple outcome measures. The impact of reading exposure was determined by **correlations** between (a) a commonly used measure of reading exposure and (b) measures of reading comprehension, oral language skills (oral vocabulary knowledge), word recognition, basic decoding skills (phonological and orthographic processing), spelling, and IQ measures.

Concept 3.1: Meta-Analysis

A **meta-analysis** is a statistical procedure that assembles existing, strongly controlled research studies on a topic and then combines the data from all of the relevant studies to identify the impact of specific measures on a key variable, such as reading comprehension.

After Mol and Bus reviewed many studies for key features, their own meta-analysis included 99 acceptable research studies with a combined 7,669 subjects. All studies selected for inclusion in the meta-analysis used some type of title-recognition or author-recognition checklist measure to assess amount of exposure to print. (See Stanovich, 2000, for methods and validations.) Checklist measures list popular book or magazine titles or names of popular authors to be checked off if recognized (as a simplified explanation of a commonly used checklist measure). Of the 99 studies, 29 focused on preschool and kindergarten, 40 involved students from grades 1 to 12, and 30 involved undergraduate and graduate students. Meta-analyses were carried out for each of these three age-level groups.

Quote 3.5

> For all measures in the outcome domains of reading comprehension, [decoding, word recognition], and spelling, moderate to strong correlations with **print exposure** were found. The outcomes support an upward spiral of causality. Children who are more proficient in comprehension and [word recognition] and spelling skills read more; because of more print exposure, their comprehension and [word recognition] and spelling skills improved more with each year of education.
>
> Mol and Bus (2011, p. 267)

Concept 3.2: Correlation

A **correlation** indicates the relationship between two variables, on a scale from –1.00 (a very negative relationship) to 1.00 (a very strong relationship), with .00 indicating no relationship. Pearson correlations are indicated by *r*.

In the preschool and kindergarten set of studies, the correlation between print exposure (as reported by children's parents) and children's oral language skills was moderate with a **correlation coefficient** of $r = .34$. Similar moderate correlations were found with two measures of vocabulary knowledge ($r = .33$ and .35). (For children ages 4 and 5, there were no measures of reading comprehension.) For students between grades 1 and 12, moderate correlates were found between print exposure and oral language skills ($r = .45$), reading comprehension ($r = .36$), word recognition ($r = .38$), and spelling ($r = .42$) overall. (All reported correlations were significant, but the more important issue is the strength of relationship. For example, the shared variance of a correlation of $r = .34$ is $r^2 = 12\%$. This is a fairly strong amount of shared variance for a single variable.)

For university students, the relation between print exposure and key reading-related abilities remained strong. A strong correlation was found between

reading exposure and oral language skills (r = .58), and moderate correlations were found for reading comprehension (r = .41), word recognition (r = .34), and spelling (r = .40). Remarkably, the connections between print exposure and key reading-related abilities did not diminish as studies were carried out with university students, suggesting the importance of continued **extensive reading** for leisure purposes throughout the school grades all the way to graduate school.

Quote 3.6

> Children who choose to read books in their leisure time have larger vocabularies, better reading comprehension, and better [word recognition] and spelling skills than peers who do not read as frequently.
>
> Mol and Bus (2011, p. 285)

This study is remarkable for the story it tells. Two researchers searched for and reviewed a very large number of research studies, and they identified 99 studies that met key requirements and were appropriate for the meta-analysis. The researchers demonstrated very clearly that amount of leisure reading has a strong and long-lasting impact on developing readers all the way to very advanced levels. Moreover, it is somewhat surprising that the development of word recognition skills and spelling skills were consistently linked to amount of reading for leisure all the way through graduate school. This study reinforces the importance of reading extensively, whether for academic purposes or for reading enjoyment.

3.3.2 A Study of Early Reading Success and Later Reading Achievement and Reading Volume

The study presented here by Sparks, Patton, and Murdoch (2014) provides a direct complement to the Mol and Bus (2011) study. Mol and Bus analyzed 99 different studies that met minimum research-design requirements and identified consistent significant patterns across the studies and across ages. They then aggregated many studies to draw their conclusions. In the present study, Sparks et al. followed the same students for 10 years to assess the relationships between print exposure (amount of reading) and multiple reading component skills as well as reading comprehension. Sparks et al.'s 10-year **longitudinal study** was a replication of an earlier 10-year longitudinal study. Both studies highlight the power of print exposure (or reading experience, amount of reading, reading practice, or reading extensively—whichever term one uses). The bottom line is that no other single predictor in reading research matches the predictive force of "the amount or reading" done by a learner for the long-term development of reading abilities. This emphasis on reading experience is also consistent with recent research that examines the role of implicit learning and other underlying cognitive skills.

Quote 3.7

> There is a strong consensus in the research literature and in popular culture about the importance of broad and frequent reading. Research has demonstrated that exposure to print, or the amount of reading a student does, is a unique and powerful contributor to a variety of academic achievement skills, including oral language, basic reading skills, spelling, content/declarative knowledge, and vocabulary skills …. Additionally, the amount a person reads appears to contribute to growth in broad cognitive skills.
>
> Sparks, Patton, and Murdoch (2014, p. 190)

Sparks et al. (2014) replicated a 10-year study by Cunningham and Stanovich (1997). In the original study, Cunningham and Stanovich followed 27 students for 10 years from 1st grade to 11th grade. In Sparks et al.'s study, 54 students were followed from 1st grade to 10th grade. Aside from doubling the number of students being followed, Sparks et al. also expanded the range of reading ability measures taken in grades 1, 2, 3, 5, and 10 to include spelling, IQ, and listening comprehension skills in addition to word recognition skills, vocabulary skills, reading comprehension skills, and general/cultural knowledge. The impact of print exposure on grade 10 reading, language, and general/cultural knowledge is the main goal of the study.

Sparks et al. used the same research methodology as Cunningham and Stanovich (1997) by running **multiple regression models (**or **analyses)** with a forced entry of a control variable first (in this case, an **autoregressor**). For example, such an approach would assess reading abilities in 5th grade by first entering the same type of reading ability measure from 1st grade, and only then the other variable of interest (e.g., the print exposure measure). This approach is very conservative because we expect that the measure of reading ability in 1st grade will account for much of the variance that is shared with reading in 5th grade. It then examines whether the next entered variable of interest will still be a significant predictor of reading in 5th grade based only on the remaining available variance. So what did they find?

The researchers first analyzed the impact of print exposure on three measures: 10th grade reading ability, language knowledge, and cultural knowledge using a regression analysis for each of these three measures. The analyses examined the extent to which the three major 10th grade measures (reading ability, language knowledge, and general/cultural knowledge) would be accounted for by print exposure after the variance that is shared between 1st grade reading and each of the three 10th grade measures was removed first. As the next entry in the regression models, print exposure significantly accounted for additional variance for grade 10 reading (21%), language (7%), and general/cultural knowledge (52%). The relationship between print exposure and general/cultural knowledge in 10th grade is very strong.

Concept 3.3: Shared Variance

The **shared variance** is the amount of overlap (in percentage terms) of one variable with another variable, or, what they have in common. Shared variance is often reported in statistical software programs, but can also be generated by squaring any correlation coefficient. (For example, $r = .20$ can be squared to generate $r^2 = .04$, or 4% shared variance.) However, one cannot simply add up the shared variance of each correlation when there are multiple correlations to arrive at a total shared variance percentage because several correlation coefficients may overlap with each other.

Sparks et al. carried out additional regressions to examine the impact of print exposure on reading by first controlling for word reading skills, spelling skills, vocabulary knowledge, and listening comprehension. To simplify results, we report the results of just 5th grade variables entered first on 10th grade reading and then find out if exposure to print is still a significant predictor of additional variance at 10th grade. For example, 5th grade word recognition was entered to account for variance that is shared with 10th grade reading first, and then exposure to print was added (after the shared variance between 10th grade reading and word recognition skills from 5th grade was removed). Exposure to print accounted for an additional 18% of variance in 10th grade reading. The same significant findings appeared with spelling (additional 12% in exposure to print), vocabulary (additional 13%), and listening comprehension (additional 28%). If we think back to the Simple View of Reading (SVR, introduced in Chapter 1), exposure to print accounts for significant additional variance with 10th grade reading ability after each of the major SVR component skills have been removed (one by one), and we know from prior research that 10th grade reading is strongly accounted for by listening comprehension. The powerful conclusion must be that exposure to print is a major predictor of reading ability across the grades and at 10th grade. Adding power to this conclusion is that this study is a replication of an early longitudinal study that had arrived at the same conclusions, but with fewer students and with fewer measures of component skills over time.

One final result deserves mention: Sparks et al. also explored the extent to which various reading and language skills across grades, in turn, predicted the score on the exposure to print measure. They found that exposure to print (amount of reading) was predicted by grade 2 and grade 3 reading. So, early reading ability also predicted how much students would read at later points. Thus, a reciprocal supporting relationship seems to exist over time between reading abilities and amount of reading (a virtuous circle; see also Pulido & Hambrick, 2008). The measures for vocabulary and basic reading strongly predicted amount of reading as well.

Quote 3.8

> Our replication of Cunningham and Stanovich's longitudinal study adds to the ample and growing body of evidence that points to the powerful, long-term benefits in providing children with a strong start in reading. Our findings support further the reciprocal nature of strong reading skills (decoding, comprehension) and engagement in reading (print exposure) …. Through reading, [students] strengthen not only their reading skills but also reading-related and cognitive skills such as spelling, vocabulary, listening comprehension, and declarative knowledge.
>
> Sparks, Patton, and Murdoch (2014, p. 209)

This study involved following students for 10 years, collecting a range of assessment data during that time, and then determining the impact of amount of reading (print exposure) on 10th grade reading and reading-related skills. This study represents a story that extends almost 30 years, counting the original Cummingham and Stanovich (1997) study and Sparks et al.'s replication study. We can only imagine the care, effort, and determination of these researchers to reach these successful conclusions.

3.3.3 A Study of Statistical Learning Related to Early Literacy Skills

One of the ways the amount of reading experience has an impact on the development of reading abilities is through the roles played by several underlying cognitive abilities that support reading development. Some of the more obvious general cognitive skills that underlie *all learning* include skills commonly associated with language development and reading abilities (e.g., background knowledge, long-term memory, inferencing, working memory, phonological awareness, and motivation).

There are also less obvious or intuitive general cognitive abilities that are now being examined more intensely for their likely roles in language and reading development. These truly underlying general cognitive skills include speed of processing, inhibitory control, selective attention, attention shifting, consolidation, **associative learning**, and **statistical learning** (among other possibilities). The research reported on here by Spencer, Kaschak, Jones, and Lonigan (2015) is a study involving the role of statistical learning on early literacy-related skills. This study is a clear and direct example of several such studies being reported on in reading research journals. Statistical learning first arose as an important avenue of language research with the link from **connectionist theories** to reading comprehension (based on probabilistic learning of co-occurring patterns in language and intended to reflect neural processing). Since the 1980s, increasing research has examined the impact of co-occurring pattern frequencies throughout language at all levels: sound and letter sequences, syllable sequences, morpheme co-occurrence frequencies, word form co-occurrence frequencies, word meaning relationships, word groups, phrasal patterns, word

association patterns in sentences and paragraphs, and organizational patterns across text segments (see Arciuli & Simpson, 2012; Ellis, 2015; Seidenberg, 2017; Siegelman & Frost, 2015; Treiman & Kessler, 2006; Yurovsky, Fricker, Yu, & Smith, 2014).

Spencer et al. (2015) examined the impact of statistical learning on early literacy-related skills among 553 pre-kindergarten to 2nd grade students. The children were trained on two measures of statistical learning (a simple word segmentation task and a visual sequence-learning task). The researchers also took measures of oral language abilities, vocabulary knowledge, and phonological processing. The research procedure used was an advanced procedure**—structural equation modeling (SEM)**. The goal of SEM is to identify the significant relations between the statistical learning measures and all the language measures (as well as the relationships among all the language measures).

Concept 3.4: Structural Equation Modeling

Structural equation modeling is an advanced multivariate procedure that has been used more often in reading research and in applied linguistics research in the past decade. SEMs are generated based on the researchers' predictions for paths among variables that (a) show the impact of one variable on the next one and (b) report the strength of that impact. Acceptable "goodness of fit" statistics indicate that the actual data are a good fit with the predicted pathways. In addition, the pathways represent a *unique* impact on the target (or dependent) variable and not a relationship that is shared with other variables in the model. A further strength of SEMs is that error variance is controlled in the analyses so that relationships are more reliable estimates. The reported **path coefficients** can be understood as similar to, but not the same as, **regression coefficients**. A direct pathway from one variable to a second one is a *direct impact*; a pathway that goes to one other variable before going to the predicted variable is an *indirect impact*. Both direct and indirect pathways are important results to consider. (See Appendix 3-A for a visual representation of an SEM pathway analysis.)

One statistical measure in this study involved first exposing children to spoken sequences from an artificial language with sounds (consonant–vowel pairs) in strings. The strings had four consistent word-like patterns embedded in the strings ("nifopa," "dibo," "kuda," and "lagoti"). Children listened to 12 training "sentences" totaling about one minute, for example, hearing "moni-fo-pa-di-bo-ku-da-la-go-ti-fa" in a slow neutral voice. In the testing phase, children heard two "words" and were asked which one they had heard in the training phase. The second statistical measure first involved a brief training

during which children matched sequences of four different colored squares (combinations of red–green–blue–yellow) that appeared on a screen in sets of two to five colored squares. Children, for example, might see a sequence (red–blue–red–green–yellow) and then reproduce that sequence on a screen. In the brief follow-up test phase of the task, children saw two color sequences and chose which one was a sequence they had seen already during the training phase. How the children scored on these statistical learning measures was then compared with how they scored on early literacy measures of phonological processing, morphological knowledge, oral vocabulary knowledge, and oral sentence comprehension.

The key outcome of the study was an SEM model of relationships among the measures. The SEM identified significant relations between the statistical learning measures and the oral language and phonological processing measures.

Quote 3.9

> We found a small but reliable relation between our measures of statistical learning and our measures of literacy skills. Statistical learning thus appears to be related to three central components of early literacy: oral language skill, vocabulary knowledge, and phonological processing.
>
> Spencer, Kaschak, Jones, and Lonigan (2015, p. 484)

You might ask, why is this important? In fact, the researchers' conclusions have major consequences for reading instruction and reading development. The answer is that children's literacy skills development, even at very early stages, is tuned to implicit learning and exposure to statistical relationships in language, and especially in words. Our brains have very powerful statistical processing capabilities without us even being aware of this ability. This study provided just a very brief exposure to statistical patterning in input data. Imagine that this impact was magnified many thousand-fold over years of exposure to language, including every time a child or adult reads, and then the importance of our abilities with respect to statistical learning suddenly looms very large.

Our exposure to implicit statistical learning is strengthened continually through frequent exposure to texts and extensive amounts of reading. Statistical learning effects, like implicit learning more generally, only emerge from hundreds, or even thousands of hours of practice over an extended period of time. (See discussion of *deliberate practice* in Chapter 5.) Effects eventually emerge as broad and deep vocabulary knowledge (Lexical Quality Hypothesis), advanced morphological knowledge, more effective processing of complex syntactic structures, strong spelling skills, better reading fluency and automaticity, greater awareness of text structure, and other advantages related to reading processes and background knowledge. Statistical learning also helps provide one explanation for how children and young adults can learn 3,000 to 4,000 new words each year to adulthood (if they continue to read). At the same time, statistical learning

skills applied to reading development does not mean that explicit instruction, support, and guidance are not also important. To be very clear, explicit instruction and support are also critical for reading development, as are reading a lot and reading frequently (Ellis, 2015; Seidenberg, 2017).

Quote 3.10

> Statistical learning takes place without conscious awareness or intention. It is a kind of implicit, unconscious learning, a complement to the explicit learning with conscious awareness that occurs with overt instruction …. The two types of learning are different but linked because both result in changes to the neural system for long-term memory. Well-timed and targeted instruction is effective because it accelerates the acquisition of this enormous data structure. Explicit instruction and conscious effort are the visible tip of the iceberg; statistical learning is the mass below the surface.
>
> Seidenberg (2017, p. 87)

This innovative study represents a fascinating story. The researchers managed to link a generally important cognitive ability directly to early literacy skills with a very creative experiment. The instructional implications that emerge from statistical learning and implicit learning more generally demonstrate the importance of understanding the many areas of underlying cognitive learning skills as they are directed to reading comprehension development. The next study highlights yet another set of underlying cognitive skills—but ones that are likely more familiar to us all.

3.3.4 A Study of the Relationships among Motivation, Engagement, Achievement, and Instruction

In a major study by Guthrie, Klauda, and Ho (2013), the relationships among motivation, engagement, achievement in reading, and effective instructional practices for reading development were examined. Motivation and engagement are two general cognitive abilities that shape a child's (and adult's) interaction with the world and impact their capacities for learning. With respect to reading more specifically, motivation to read and the act of engaging in reading are important factors for reading development. Equally important for this study was the researchers' extension of their earlier work on Concept-Oriented Reading Instruction (CORI), an instructional approach designed to support reading motivation, reading engagement, and reading achievement. Guthrie and his colleagues have shown that CORI is effective with elementary-grade students in research spanning 20 years (see Guthrie, 2015). This study differs because the researchers carried out a very large experimental **training study** with middle-school students in 7th grade (rather than with elementary school students) and used a different type of science-oriented CORI unit.

This study involved 1,159 7th graders, of whom 854 were taught for six weeks through a CORI unit. The remaining students were a large control group. Students filled out a motivation and engagement survey that measured seven aspects of reading motivation and two aspects of reading engagement. Four positive reading motivation aspects were intrinsic motivation, self-efficacy, valuing, and prosocial goals, and three negative associations with motivation were perceived difficulty, devaluing, and antisocial goals. Two reading engagement aspects were represented by dedication to reading and avoidance of reading. All nine of these aspects of motivation and engagement were measured through a single survey instrument.

Concept 3.5: Reading Motivation and Engagement

Motivations for reading include goals, values, beliefs, and dispositions toward reading. Motivation is driven by intrinsic interest and enjoyment of reading, confidence in reading ability, and the view that reading is important to one's goals and a support for social interaction. Essentially, motivation addresses the desire to read and achieve personal goals. **Engagement** is represented by the actions to carry out reading goals and beliefs, responding to positive motivations to read. Engagement represents the *doing* part of reading: the reading of text, persistence in reading, frequency of reading, and dedication to reading activities (see Guthrie, Klauda, & Ho, 2013).

A six-week science unit was created for the **experimental group** based on CORI principles. The thematic unit was taught daily for 90 minutes each week during the reading and language arts time in the curriculum. The unit was based on plants and animals in community interactions, focusing on symbiotic relations and parasitic relations. For each of the six weeks, students were given a *big question* for the week as well as daily questions. All CORI classes incorporated aspects of motivation and engagement support: enabling success, providing choice, fostering collaboration, emphasizing importance, promoting relevance to personal experience, and learning text content through a thematic unit. The reading and language-development skills incorporated into the unit included multiple-text reading for the whole class, individual guided reading, group projects, and strategy instruction. Strategy instruction focused on goal setting, inferencing, summarizing, and concept mapping (graphic representations).

Students read multiple texts, books, and book sections at grade level with several being self-selected readings to immerse themselves in large amounts of topical knowledge. Students often worked in teams to practice strategies, support each others' comprehension of readings, and discuss possible answers to posed questions. (See Chapter 6, section 6.1.4.2, for additional details about

CORI.) The **control group** classes worked with a grade-level literature anthology for 90 minutes per day each week and engaged in activities and assignments provided by the anthology and tasks normally assigned by the teachers. Two versions of a reading comprehension measure were created (to serve as pre- and post-tests).

All of the data from the seven motivation measures, two engagement measures, and the pre- and post-reading comprehension measures was entered into two structural equation models (SEMs). Each model generated appropriate goodness of fit statistics among the variables measured at the pre- and post-training phases. The first model examined only relationships among motivation, engagement, and achievement at the pre-intervention stage. As such, this first model provided an initial picture of the relationships among motivations, engagement, and achievement.

Pre-training descriptive data showed that students were not intrinsically motivated by informational-text comprehension (a negative correlation). Other motivation measures only partially matched expectations from prior research. For example, "intrinsic motivation" and "value" variables were significant and negatively related to achievement even though they are common measures of affirmative motivation. The impacts of motivation on engagement measures were stronger and in line with expectations: positive motivations positively impacted dedication, and the negative motivations strongly supported avoidance. The two engagement measures directly impacted informational-text comprehension results as expected. The statistical outcome of this pre-instructional model is that motivation toward reading informational texts was low but that students were generally willing to engage. Those who engaged more had higher achievement scores. The takeaway message is that, prior to CORI instruction, students were minimally motivated, but were willing to engage with informational texts. Engagement, in turn, was only moderately related to pre-treatment achievement scores.

A second SEM with appropriate fit statistics incorporated the impact of CORI instruction included as a post-training SEM. The informational-text comprehension testing now generated a measure of the differences in scores between pre- and post-instruction. In this model, instruction impacted motivation strongly and all in expected ways. Intrinsic motivation, self-efficacy, value, and pro-social goals were all improved by CORI. Negative motivations were all decreased by CORI. In addition, CORI instruction positively impacted dedication. Intrinsic motivation did not impact dedication, but it strongly and negatively impacted avoidance. The negative motivations all impacted avoidance. Three of the motivations (self-efficacy, negative value for perceived difficulty, and negative value for antisocial goals) also directly impacted informational-text test performance, all in expected ways. CORI instruction also positively and directly impacted the comprehension measure. Engagement, in this model, did not directly impact comprehension-test results. Together, all of the contributing variables accounted for 56% of the variance in the comprehension test gains, which is a very strong outcome.

Quote 3.11

> Our findings suggested … that working to improve varied facets of student motivation is important; it may have positive consequences for [students'] engagement of increased dedication and decreased avoidance, as well as impact their level of achievement …. Instruction directly predicted several motivations, engagement, and achievement. This pattern of findings suggests that improved engagement and achievement as well as motivation are reasonable goals for instructional methods that incorporate explicit … supports for strengthening student motivation.
>
> Guthrie, Klauda, and Ho (2013, p. 24)

This study was a very large-scale **treatment** experiment examining the impacts of instruction on motivation, engagement, and reading achievement gains. All experimental studies that involve extended training time tell interesting stories. There is always a bit of intrigue because so many things can go wrong when training students for an extended period of time. The researchers have to work hard to ensure that all the instruments to measure motivation, engagement, and achievement are effective. The planning and effort to carry out the training appropriately and fairly can be very demanding. This particular training was complex with many facets to the instruction. The statistical procedures used were complex but appropriate for the researchers' goals. The outcomes of the Guthrie et al. study reveal an insightful story about a specific form of training (i.e., CORI) that can improve both students' motivation and reading comprehension.

3.4 Research on Specific Component Skills in Reading Comprehension

The first four research studies described in this chapter (Sections 3.3.1–3.3.4) cover underlying cognitive abilities related to reading: (a) incidental learning of morphology, word recognition skills, spelling, and reading comprehension through extensive reading (implicit learning); (b) lexical quality development through reading experience (implicit learning); (c) statistical learning skills; and (d) motivation and engagement. Other reading research studies on underlying cognitive skills that are not introduced in this chapter examine maintenance of attention, inhibition, shifting, cognitive flexibility, planning, monitoring, and working memory (e.g., Arrington et al., 2014; Cantin et al., 2016; Cartwright, 2015; Georgiou & Das, 2018; Kieffer, Vukovic, & Berry, 2013; Nouwens, Groen, & Verhoeven, 2016). However, we want to shift our coverage of research studies to expand into relationships between linguistic processes and resources on one hand and reading comprehension on the other. These linguistic component skills include word recognition, morphology, vocabulary, text reading fluency, **syntactic knowledge**, text-structure awareness, and inferencing (with inferencing also counting as an underlying cognitive skill). We turn to these linguistic factors now.

3.4.1 A Study Exploring Vocabulary Growth and Reading Development across Elementary Grades

In this study, Verhoeven, van Leeuwe, and Vermeer (2011) examine the relationships among word decoding, vocabulary, and reading comprehension longitudinally over six years with Dutch children. Previous research with these variables indicated that early word recognition skills impact both vocabulary and reading abilities in early grades, but not in later grades. Vocabulary and reading comprehension appear to impact each other as they develop together through later years of elementary school. Prior research did not, however, explore these relationships longitudinally, following the same large numbers of students across six grades.

Verhoeven et al. used a nationwide sample of 2,790 children in the Netherlands and assessed children's developing Dutch L1 abilities from grades 1 to 6. Students completed assessment measures of basic vocabulary in the fall and spring of grades 1 and 2. They then took a more advanced, written vocabulary test each spring of grades 3 to 6. In addition, they took word recognition tests in spring and at the end of year 1 and each following spring from grades 2 to 6. They also took tests of reading comprehension in spring of each year for grades 2 to 6.

Two key SEMs were explored. The first model combined the assessment interactions between word recognition and vocabulary across all assessment periods. First, basic (oral) vocabulary (grade 1 and grade 2) predicted each subsequent basic vocabulary measure. Advanced (written) vocabulary (beginning in grade 3) also strongly predicted subsequent advanced vocabulary measures with overall shared variance at 92%. Word recognition predicted growth in subsequent word recognition in each following year throughout the six grades. The switch from basic oral vocabulary to advanced, written vocabulary assessments revealed a significant word recognition coefficient explaining vocabulary growth between grade 2 and grade 3. Word recognition also predicted advanced vocabulary growth between grade 4 and grade 5, but with only a small impact.

In the second model, reading comprehension was combined with vocabulary and word recognition test results from grades 2 to 6. Reading comprehension strongly predicted subsequent reading comprehension test results for each grade from grade 2 to grade 6. The addition of the reading comprehension measure also interacted with vocabulary strongly and mostly in predicted ways. Vocabulary predicted subsequent reading comprehension measures strongly from early grade 2 to later grade 2, from grade 3 to grade 4, and from grade 5 to grade 6. Finally, reading comprehension significantly predicted vocabulary in grade 3. Reading comprehension in grade 2 was the strongest predictor of advanced vocabulary in grade 3, reducing the impact of word recognition on the more advanced, written vocabulary test.

What a story this is! Conclusions from the six-year study highlight a number of major findings. First, as to be expected, word recognition, vocabulary, and reading comprehension measures all strongly predict subsequent growth in each following year. The relation between vocabulary and word recognition highlights

the importance of early oral vocabulary knowledge (basic vocabulary measure) to support early development of word recognition skills. In turn, word recognition provided a significant if small level of support for subsequent written vocabulary knowledge (on the first advanced vocabulary measure, in grade 3). The addition of a reading comprehension measure for every grade from grade 2 onward leads to further interesting results. Reading comprehension abilities in grade 2 strongly predict written vocabulary knowledge in grade 3. Thereafter, the reverse trend is found, with vocabulary knowledge directly supporting subsequent reading comprehension measures from grade 3 to 4 and from grade 5 to 6. Word recognition has no direct impact on reading comprehension, but it has an indirect impact in years 2 and 4 on reading comprehension.

The results of this study confirm a number of smaller-scale studies involving the growth and interaction of word recognition, vocabulary, and reading comprehension skills. First, it provides evidence that word recognition supports vocabulary growth up through grade 3. Second, basic oral vocabulary knowledge in lower grades supports the development of written vocabulary growth from grade 3 onward. Third, vocabulary supports reading comprehension fairly consistently throughout the elementary grades. Fourth, in the transition from oral vocabulary knowledge to written vocabulary knowledge, reading comprehension in grade 2 plays a strong role in predicting vocabulary knowledge in grade 3, thus showing a reciprocal relationship between reading and vocabulary knowledge. Finally, word recognition does not play a significant unique role in reading comprehension abilities in later elementary years. This confirms that, in the case of Dutch as an L1, word recognition plays a less prominent role in reading comprehension in part because the Dutch language is a more orthographically transparent language than English (see Chapter 2, the Orthographic Depth Hypothesis).

Quote 3.12

> Beginning vocabulary was found to predict early word decoding and reading comprehension …. Moreover, a reciprocal relationship between the children's advanced vocabulary and reading comprehension was detected. The data provide support for the lexical quality hypothesis as knowledge of word forms and word meanings predicts the development of reading comprehension.
>
> Verhoeven, van Leeuwe, and Vermeer (2011, p. 8)

Six years of data collection with over 2,000 students is a major undertaking; the study should be viewed as a compelling story about learning to read in Dutch. Again, a well-designed longitudinal study sheds light on many issues that are discussed by researchers more generally: the Simple View of Reading is prominent but does not work entirely as it works for English. The strong role of vocabulary highlights the Lexical Quality Hypothesis. The Orthographic Depth Hypothesis makes an appearance to help explain results with respect to word recognition in Dutch.

There is also a hint of reading comprehension and vocabulary being involved in a reciprocal learning relationship. This is a story that begs for more episodes.

3.4.2 A Study Exploring the Role of Morphological Knowledge in Vocabulary and Reading Comprehension

To this point, we have considered the roles of two component skills, word recognition and vocabulary, in reading comprehension. In the past 10 years, a number of major studies have explored the role of **morphological knowledge** in reading development (e.g., Deacon, Holliman, Dobson, & Harrison, 2018; Deacon, Kieffer, & Laroche, 2014; Goodwin et al., 2017). In the study reported here, Goodwin, Petscher, Carlisle, and Mitchell (2017) demonstrate the impact of morphological knowledge on both vocabulary growth and reading comprehension with students in 7th and 8th grades.

Goodwin et al. assessed 371 7th and 8th graders in the U.S. using seven distinct measures of morphological knowledge to find out how different measures of morphological knowledge would predict vocabulary knowledge and reading comprehension. In addition to the morphological knowledge measures, all the students took a standardized test of vocabulary knowledge and a standardized test of reading comprehension.

To analyze the results, the researchers first used **confirmatory factor analysis** and proposed a factor model with two parts. First, it predicted that a *composite* variable, a simple combination of the seven different morphology measures, would predict vocabulary and reading abilities; second, the researchers also predicted that a number of the seven types of morphological knowledge would individually account for additional variance, independent of the composite variable, in vocabulary and reading abilities. The confirmatory factor analysis required the researchers to predict the expected outcome that would best match the data that were collected. The best model showed a strong composite morphology factor with all seven morphology measures grouped together. Then, through a secondary factor (of the confirmatory model), the analysis showed additional unique positive relationships for several of the individual morphology measures with either reading or vocabulary knowledge.

The outcome of the factor analysis was then re-analyzed as an SEM to determine (a) how well the morphological composite variable predicted vocabulary and reading abilities and (b) how each of the more specific measures contributed independently to vocabulary and reading. The SEM model showed that the composite morphology variable correlated significantly and very strongly with both reading (path coefficient of .70) and vocabulary (path coefficient of .76). In addition, four of the seven distinct morphology measures significantly, and independently of the composite measure, accounted for the students' performances on reading and vocabulary measures. The composite of morphology measures accounted for 61% of the shared variance with reading, which is very strong. The morphology measures, both as composite and individually, accounted for 69% of the variance in vocabulary knowledge, again a very strong relationship.

Quote 3.13

> For adolescent readers, it seems that the general factor that represents a student's general ability to use, identify, and manipulate morphemes within words is particularly important for facilitating vocabulary knowledge and reading comprehension. [More specifically,] applying morphological knowledge to derived word meanings is also helpful in supporting reading comprehension and vocabulary, while generating morphologically complex words, or thinking about words within morphological families, is helpful in building vocabulary knowledge.
>
> Goodwin, Petscher, Carlisle, and Mitchell (2017, p. 111)

These results argue that morphology is an important contributor to both vocabulary knowledge and reading abilities for both 7th and 8th graders. It also shows that morphological knowledge is a complex skill in its own right, and both the general factor and certain specific sub-abilities independently predict reading comprehension and vocabulary knowledge (cf. Deacon, Kieffer, & Laroche, 2014, for research in elementary grades). The key takeaway message of this study is that morphological knowledge is an important component skill that is part of both vocabulary knowledge and reading abilities. This outcome, along with prior research, strongly supports Perfetti's Lexical Quality Hypothesis. The better our morphology knowledge, the better our vocabulary knowledge and reading comprehension. It also shows the important role of morphological knowledge for middle school students, confirming the idea that morphological knowledge becomes increasingly important for older students (who deal with more words that are morphologically complex). This study is also an interesting story of researchers digging deeper into how morphology can support vocabulary and reading abilities. They pursued the idea that component linguistic skills are really very complex and have to be looked at from many angles. They explored several creative ways to examine morphology, and the conclusion leads to an important implied moral—every component skill of reading is, in itself, quite complex. (See also Kim, 2017, for a similar approach to the Simple View of Reading.)

3.4.3 Oral Text Reading Fluency and Its Impact on Reading Comprehension

Oral reading fluency (at word, sentence, and text levels) has been a continuing focus of research since the National Reading Panel (NRP) (2000) asserted its importance to reading development. Over the past 20 years, this topic has been explored in detail both for L1 and L2 students, and for both younger and older readers (Kim & Wagner, 2015; Klauda & Guthrie, 2008; Tighe & Schatschneider, 2014). One particular issue that has become increasingly important is the role of oral text reading fluency as a strong measure of reading abilities. Word reading fluency is generally regarded to be important at early stages

of reading development but less so for grade-level students beyond grades 4 or 5. However, passage reading fluency is seen as a likely key component skill predicting reading comprehension all the way into adulthood (see Fuchs et al., 2001).

Quote 3.14

> Highly fluent readers demonstrate automaticity in reading connected texts, such that the cognitive resources needed for single word decoding are freed up to allow for meaning to be processed.
>
> Tighe and Schatschneider (2014, p. 102)

One particularly important study is that by Tighe and Schatschneider (2014). They examined the developmentally changing role of text reading fluency as a predictor of reading comprehension among 3rd, 7th, and 10th graders, along with the roles of listening comprehension, verbal reasoning (vocabulary and inferencing), non-verbal reasoning, and working memory. The researchers gave a test battery of 21 measures to 585 students (215 3rd graders, 188 7th graders, and 182 10th graders). **Factor analyses** were used to create groupings or **latent factors** of the 21 measures, resulting in (a) a fluency composite measure; (b) a verbal reasoning composite measure that combined listening comprehension, vocabulary, and inferencing; and (c) a working memory composite measure. It is fair to consider the verbal reasoning composite as primarily a verbal language comprehension composite; thus, we use the term "language comprehension" composite for ease of reference.

Starting with the earliest grade, the 3rd grade measures created the only (minor) exception in the factor analyses, with four composite predictors forming the best solution as a factor analysis. At 3rd grade, the oral fluency composite was the strongest predictor of reading comprehension. This result most likely reflects the importance of early word recognition abilities alongside text reading rate development and automaticity of basic word processing. It also converges well with the now extensive research on the SVR. The language comprehension composite was the second strongest predictor of reading ability (as would be predicted by the SVR). Both composite predictors of reading ability in 3rd grade were strong and accounted for a large amount of variance. The non-verbal reasoning composite predictor added just 1% variance, bringing the total shared variance to 71% with reading comprehension. Working memory did not account for any unique variance when combined with the other three composite measures.

In 7th grade, three composite predictors were created by a factor analysis of the original 21 measures. The language comprehension composite became the strongest predictor of reading abilities, but the fluency composite was still a strong independent predictor of reading abilities. The two composite measures together accounted for 63% of shared variance in reading. The working memory composite score again did not add any additional variance in reading.

In 10th grade, the language comprehension measure was the dominant predictor measure; it accounted for 64% of the variance in reading. Fluency accounted for 37% of variance in reading on its own, but when combined with the language comprehension measure fluency accounted only for an additional 4% of the variance in reading. The total shared variance with reading was 68%. Again, working memory did not add any additional variance in reading.

Based on these results, one might conclude that the SVR does not work well to explain reading abilities in either the 7th grade or the10th grade. Word recognition has disappeared for all practical purposes as an independent predictor of reading. However, the language factor increasingly accounted for reading abilities in higher grades, as SVR would predict. Reading fluency, on its own (and separate from word recognition), was highly correlated with reading comprehension at all three grade levels (correlations between .88 and .80 across the three grade levels for fluency and reading comprehension). So while word recognition practically disappeared as a factor, oral text reading fluency was still a strong contributor in 3rd and 7th grades. By 10th grade, it was not a strong independent contributor (but shared a strong relationship with language comprehension that needs to be explored further). Working memory was a weak composite measure by 10th grade that, again, did not contribute to the variance in reading. This finding suggests that working memory may still be a "work in progress" as a consistent predictor of reading comprehension.

Quote 3.15

> Working memory contributed uniquely [on its own] to reading comprehension for all grades; however, in conjunction with the other predictors, working memory did not add any additional variance. The finding is consistent with past research, which has produced mixed findings regarding the predictive ability of working memory to reading comprehension.
>
> Tighe and Schatschneider (2014, p. 123)

This study had a strong research design, essentially combining word recognition and passage fluency with vocabulary, listening comprehension, and inferencing skills through factor analysis. More specifically with respect to reading fluency, the study highlights a very important message. In L1 contexts, where some level of "reading expertise" develops for readers by 10th grade, a single measure oral text reading fluency is still consistently found to be an important predictor of reading comprehension on its own. As a study that teases apart verbal comprehension, word recognition, and oral reading fluency, there is a good story to tell. After much effort collecting 21 measures of component skills from 585 students, the researchers were able to develop a compelling "narrative" for how oral text reading fluency plays some important role throughout the school years.

3.4.4 The Role of Syntactic Awareness in the Development of Reading Abilities

One of the major challenges in L1 reading research is strongly demonstrating that syntactic awareness directly predicts reading comprehension abilities. Studies of reading disabilities among low-performing children demonstrate a role of syntactic awareness in reading difficulties. However, syntactic awareness has appeared in prior research to contribute only in marginal ways with grade-normal L1 reading populations (Cain, 2007). We know that syntactic awareness is one of the most powerful contributors in L2 reading studies (Geva & Farnia, 2012; Jeon & Yamashita, 2014; Shiotsu, 2010). Moreover, there are theoretical reasons why syntactic awareness should be a major "pressure point" for possible reading difficulties. It is fairly obvious that readers without a strong knowledge of syntax would have a difficult time reading extended texts (or even sentences).

One likely complication in prior L1 reading research on syntactic awareness is that it may not have been measured in multiple reliable ways. It was long assumed that syntactic awareness was somehow a naturally given skill with relatively little individual variability for L1 readers. Certainly, it is not a skill that has been actively taught to help L1 readers improve their comprehension skills. However, two recent L1 research studies are now showing that syntactic awareness is a strong predictor of reading abilities (Brimo, Apel, & Fountain, 2017; Deacon & Kieffer, 2018). We report here on the study by Deacon and Kieffer (2018) because of its longitudinal component.

Deacon and Kieffer wanted to know what impact syntactic awareness would have on reading comprehension for both 3rd and 4th graders. They also wanted to use 3rd grade data to provide a longitudinal analysis of syntactic awareness on reading ability. They conducted a study of 100 children longitudinally for one year from 3rd grade to 4th grade, testing students in both 3rd and 4th grades. They assessed syntactic awareness (a) using word order errors and (b) requiring sentences to be reordered correctly. They also used a number of other language and cognitive measures (i.e., measures of word reading skills, phonological awareness, and non-verbal reasoning) as control variables to see if syntactic awareness would account for significant variance in reading abilities independent of the variance in reading accounted for by all the other variables.

Quote 3.16

> Syntactic awareness is often conceptualized as supporting parsing of sentences into smaller components, which are in turn recombined into text level representations …. This is the basis for the prediction that awareness of sentence structure directly supports reading comprehension.
>
> Deacon and Kieffer (2018, p. 73)

The researchers used three SEM analyses with multiple control variables. The first SEM analysis included all of the measures in grade 3 to identify significant direct predictors of grade 3 reading ability. Results showed that both syntactic awareness and word reading skills accounted for reading ability independently of each other. No other control variables significantly predicted reading. A second SEM was conducted with 4th grade testing results to identify significant predictors of grade 4 reading. The larger number of significant independent predictors in grade 4 (adding morphological knowledge and oral vocabulary knowledge) reflected a change from stronger word reading influence to stronger language skills influence, as predicted by the Simple View of Reading. Finally, a third SEM was performed that predicted grade 4 reading using grade 3 variables, including 3rd grade reading ability (the autoregressor). The path analysis showed that grade 3 reading ability (as expected), 3rd grade syntactic awareness, and 3rd grade word reading skills all predicted grade 4 reading independently. (See Appendix 3-A for a visualization of this SEM analysis.)

Quote 3.17

> First, we show that at each of grades 3 and 4, syntactic awareness had a direct, practically important relation to reading comprehension …. Second, we show that syntactic awareness predicts subsequent gains in reading comprehension at grade 4, after controlling for other verbal and nonverbal abilities …. These findings encourage us to retain an emphasis on syntactic awareness in theories as a direct determiner specifically in reading comprehension.
>
> Deacon and Kieffer (2018, pp. 9, 11)

This study offers important insights into the direct impact of syntactic knowledge on reading comprehension. Syntax really does have a role to play in L1 reading comprehension and reading development. That conclusion raises interesting challenges about how to develop this knowledge among learners.

Deacon and Kieffer's study represents an interesting story. It explains how the researchers overcame prior ideas that L1 grammar does not explain reading ability, and it raises a number of thought-provoking issues for reading instruction in early grades. One possibility is that extensive amounts of reading and writing may have a bigger impact on syntactic awareness growth than will explicit grammar instruction to 3rd and 4th graders. We'll have to wait and see.

3.4.5 A Study of Text-Structure Instruction and Its Impact on Reading Abilities

To this point, we have highlighted a number of well-known linguistic components of reading abilities (i.e., vocabulary, morphology, fluency, and syntax) and looked at recent studies that confirm their importance for reading. With this study, we highlight an equally important language component ability, but

one that is not always so obvious. This ability involves the role of text-structure awareness on reading comprehension. This knowledge resource has been demonstrated in a series of studies by Meyer and colleagues (Meyer & Wijekumar, 2017; Meyer, Wijekumar, & Lin, 2011; Wijekumar, Meyer, & Lei, 2017) and Williams and colleagues (Williams et al., 2014, 2016). More recently, two published meta-analyses confirm more broadly the importance of text-structure knowledge and its instruction for reading comprehension development (Hebert, Bohaty, Nelson, & Brown, 2016; Pyle et al., 2017).

For the past 35 years, the awareness of discourse structure (text structure) has been viewed as an important component skill that contributes to reading comprehension (e.g., Pearson & Fielding, 1991), especially with regard to expository texts and with the more recent L1 concerns about reading challenges in middle school and high school content-area learning. Text-structure awareness includes the ability to recognize (a) higher-level organization in texts (i.e., the **rhetorical organization,** in this case, the top-level structure), (b) important ideas in texts, and (c) various verbal signals of text organization. In particular, an awareness of how texts are organized at the highest levels (e.g., as cause–effect, comparison–contrast, description, problem–solution, and sequence) appears to be one important ability that contributes to reading comprehension. Key questions include how strongly this knowledge impacts reading and how well students can be trained to recognize discourse structures so that this knowledge can be used consistently, especially when reading expository texts (Lorch, Jr., 2015).

Quote 3.18

> The skills needed to read and comprehend expository text are very different than those needed to read and comprehend narrative text …. Comprehending expository text requires students to make inferences, solve problems, reason, and use complex and varied text structures in ways that are not commonly needed in narrative texts.
>
> Hebert, Bohaty, Nelson, and Brown (2016, p. 609)

Hebert et al. (2016), in their meta-analysis of text-structure instruction, examined 45 different studies and 323 different **effect sizes** (i.e., the magnitude of the difference between experimental and control groups within and across different studies; see Concept 3.6) involving students from grades 2 to 12. The goals were to examine the extent to which text-structure instruction would impact outcome measures of text-structure awareness and reading improvement. All studies involved teaching one or more of the following five patterns of text organization: cause–effect, comparison–contrast, description, problem–solution, and sequence. Measures of training outcomes included the impact of text-structure instruction (a) using an "immediate" reading comprehension measure (a test that involves recognizing and using the same trained text-structure knowledge), (b) using similar but untrained text structures for a reading comprehension measure (a "near-transfer" measure of reading abilities), and (c) using a more general

objective measure of reading comprehension (a "far-transfer" measure that does not directly involve text-structure awareness).

A number of moderator variables were also examined, including student variables (e.g., elementary grades versus secondary grades), instructional variable (the number of different text structures taught, length of instruction, explicit teaching of signal words, explicit teaching with graphic organizers, the use of writing activities), and research design variables (sample size, type of experimental design, type of control group for comparison). These sub-analyses helped explain additional differences related to the impact of text-structure instruction on reading comprehension.

Concept 3.6: Effect Sizes

Effect sizes are outcome measures that show the difference between an experimental group and a control group (or the effect of post-treatment measure versus pre-treatment measure). Effect size is a statistic that is a meaningful interpretation of the importance of the difference between the experimental group and the control group. The most common effect-size statistic is Cohen's *d*. Generally, Cohen's *d* is interpreted as *low* effect (beginning at .20), *moderate* effect (beginning at .50), and *large* effect (beginning at .80 and higher). Other common effect-size measures include Hedges' *g* and Pearson *r* correlation (and r^2) (cf. Mol & Bus, 2011). In meta-analyses, effect-size statistics can be summarized to generate an overall conclusion for a given research question as well as specific more detailed sub-questions.

Significant differences among comparisons were determined by the use of effect-size measures (Cohen's *d*) and calculations of confidence intervals (to determine if differences were significant). Key features of many studies in this analysis included a number of training variations. Among the training variations, 44% included teaching signal words explicitly, 64% included writing activities, and 76% involved the use of graphic organizers.

The positive effect of text-structure instruction across all studies and effect sizes was $d = .56$, a moderate effect size that was significant. Positive effect sizes appeared in 85% of the comparisons. (A negative effect size would mean that the *control* group performed better than the **treatment group** at post-testing.) In addition, three moderator factors significantly changed effect-size results; these moderators include (a) the number of structures taught, (b) the use of writing in the training, and (c) competing experimental treatments (instead of just "Business As Usual" [BAU] as the control group). Explicit teaching of signal words did not by itself change effect-size outcomes, and neither did the use of graphic organizers or the school level of students. Competing experimental treatments—such as

reciprocal teaching and writing instruction support for reading comprehension—actually showed stronger training effects than text-structure instruction. Thus, text-structure instruction might best be viewed as a component of instruction that also includes (a) robust training in strategic reading skills and (b) reading and writing instruction together for content learning.

With respect to variations in outcome measures using effect sizes, analyses showed that use of the same text structure in instruction and as a post-test measure revealed a moderate effect size (.57); near-transfer effect size was also moderate (.62), but results were widely varying. Far-transfer results (e.g., a general multiple-choice reading comprehension measure) only showed a small effect size; they did not produce a significant difference in favor of text-structure instruction (a common outcome when using far-transfer measures in experimental training studies). Despite some large variability in training, in outcome measures, and in sample sizes, the meta-analysis demonstrated overall that text-structure instruction has a positive moderate impact on student learning of patterns of text organization involving expository texts.

Quote 3.19

> The results indicated that text-structure instruction improves expository reading comprehension, but the effects were tempered when text-structure instruction was compared with stronger comparison groups [alternate training outcomes]. The findings also identified 2 moderators that led to increased effect sizes (teaching more text structures and including writing in the instruction).
>
> Hebert, Bohaty, Nelson, and Brown (2016, p. 609)

Pyle et al. (2017) conducted a second meta-analysis of text-structure instruction, but with a somewhat different methodology and a more restrictive meta-analysis. Their work, similar to other studies like Hebert et al. (2016), comprised 19 studies and 48 different effect-size comparisons. The Pyle et al. study also introduced a number of different moderating variables in the analysis. Overall, the researchers reported a positive (and stronger) overall mean effect size of .95 (a large effect size). They also showed differences in outcomes of studies with specific moderator variables, particularly stronger effects when training involved 11–20 hours of training time. This study confirms the overall effectiveness of text-structure instruction, but also indicates that variations in how training is implemented and how outcomes are assessed leave much room for additional research.

These studies of text-structure instruction also highlight the idea that research studies in all areas related to reading abilities need multiple well-controlled replications (or variations on replications) before a more general concept becomes established as important in reading research and reading instruction. For text-structure instruction research, studies might focus on the following: (a) how do teachers provide effective training, (b) how do complex patterns of text structures appear in more advanced expository texts, and (c) how generalizable is training

with elementary-grade students for middle-school and secondary-school student reading abilities. These topics would all need to be explored further in additional studies. At the same time, the meta-analysis methodology of the two studies reported here are carefully done with reasonable statistical controls, and both meta-analyses identified limitations that impacted the specific studies reviewed. The story takeaway is that two studies with converging results is a better story than any single study.

3.4.6 *Examining the Impact of Inference Instruction on Literal and Inferential Comprehension: A Meta-Analysis*

In the 2nd edition of this book, we emphasized the development of the strategic reader and strategic reading instruction. This research is still an important focus for reading research (e.g., Goldman, Snow & Vaughn, 2016; Grabe & Stoller, 2019; Vaughn & Hall, 2017). In this 3rd edition, comprehension instruction does remain a part of several studies. However, there is a lesser emphasis on the explicit training of strategic readers (cf. Guthrie, Klauda, & Ho, 2013; Hebert et al., 2016). This final study, by Elleman (2017), directly addresses an important aspect of becoming a more strategic reader with a focus on inferencing instruction.

Elleman carried out a meta-analysis to examine the impact of inference instruction on the literal and inferential comprehension of skilled and less skilled students ranging from grades 2 to 9. Inference generation during reading draws primarily on connecting text information to background knowledge and/or on connecting new text information to prior text information. Inferencing processes can be thought of as strategic or automatic. Strategic inferences are usually actively initiated by the reader, and the primary mechanisms for generating strategic inferences during reading are contexts that require comprehension monitoring of challenging texts and tasks. In experimental studies, **inferencing** ability has been shown to be a strong predictor of reading abilities, particularly when students engage in challenging texts that require strategic processing and when reading goals are more demanding (i.e., a higher standard of coherence) (Perfetti, Landi, & Oakhill, 2005; van den Broek, Beker, & Oudega, 2015). At issue is how we can teach students to become more effective in using inferences to improve reading abilities.

Quote 3.20

> As readers proceed through a text, they engage in various types of inferential processes, resulting in different kinds of inferences. Some of the processes are automatic, others are strategic; some occur frequently, others occur only infrequently …. Strategic, coherence-based processes are particularly likely to occur if the automatic processes do not establish adequate coherence for the reader.
>
> van den Broek, Beker, and Oudega (2015, pp. 95, 97)

Despite the recognized importance of inferencing skills in reading comprehension (Oakhill & Cain, 2012), instructional effectiveness in generating appropriate inferences for students has not been investigated intensely. Among a few key studies, it has been shown that when students are taught comprehension monitoring and use strategies to better understand texts, their inferencing skills and comprehension have improved. However, no systematic, controlled review of the existing research studies has been carried out as a statistical meta-analysis until Elleman (2017). In her meta-analysis, she examined the impact of inference instruction on improved comprehension by looking at outcome performance on both literal comprehension questions and inferential comprehension questions in comprehension measures.

Elleman collected studies carried out between 1950 and 2014; only studies that focused on improving comprehension through inference instruction were considered. A total of 308 studies were considered for inclusion; after screening for inclusion requirements, 25 studies met inclusion criteria. Outcome measures were categorized as improved answers to prompts requiring inferential, literal, or general (combining inferential and literal) responses. Other factors were also reviewed as possible moderating variables, such as grade level, student proficiency, hours of instruction, instructor (teacher or researcher), group size (class, group, one on one), and text type (expository or narrative). Sources of inferences were categorized as text based or elaborative (through activated background knowledge). Types of inference instruction (Elleman, 2017, p. 766) were listed as follows:

1. Inference question practice and question generation.
2. Text clue integration strategy.
3. Background knowledge strategy.
4. Text structure and organization.
5. Inference types.
6. Self-explanation or elaboration.
7. Perspective taking.

From the 25 studies, a total of 25 inferential comparisons (measuring inferential comprehension outcomes), 18 literal comparisons (measuring literal comprehension outcomes), and 13 general comparisons (measuring both inferential and literal comprehension outcomes) were derived. Most of the post-training tests in the studies were researcher designed and involved open-ended questions or a recall format; only seven measures involved norm-referenced standardized measures.

Meta-analysis results were reported as effect sizes comparing outcomes of experimental and control groups. Results showed a positive effect size of $d = .58$ for general comprehension measures (a moderate effect size), $d = .68$ for inferential comprehension measures (a moderate to large effect size), and $d = .28$ for literal comprehension measures (a small but significant effect size). With inferential outcome measures, one moderator effect was grade level, and a second was student proficiency. Lower grades benefited more from instruction than higher grade levels, and less skilled students benefited more from the instruction than more skilled students. With literal comprehension outcomes, less skilled students

benefitted more (d = .97) from the instruction than did more skilled students (d = .06; not significant). Other possible moderator effects were not significant.

Quote 3.21

> Overall, the effects of inference instruction on general and inferential comprehension outcomes were moderate to large for skilled and less skilled readers …. This review showed that inference interventions are effective at increasing general and inferential comprehension skills …. A surprising finding from this review was that so few well-designed intervention studies have been conducted to address this important skill.
>
> Elleman (2017, pp. 771–772)

This study provides a compelling story about seeking but not necessarily finding the outcomes that were expected. First, relatively few studies engaged in reliable inferencing training. Second, when students were trained in making inferences, stronger students did not improve their responses to literal comprehension questions. Third, weaker students were greater beneficiaries of inference training when inferential comprehension was measured. All these outcomes were unexpected for Elleman. One story moral to take away is that not all of our expectations are met when we take a closer look.

3.5 Conclusion

The studies described in this chapter have highlighted a number of central issues and questions about reading abilities and reading development. Key connections across multiple studies point to the importance of reading experience, underlying cognitive skills applied to reading development, vocabulary and vocabulary growth, morphology and syntax knowledge, text reading fluency, text-structure awareness, inferencing training, and the generalizability of both the Simple View of Reading and the Reading Systems Framework approach for reading.

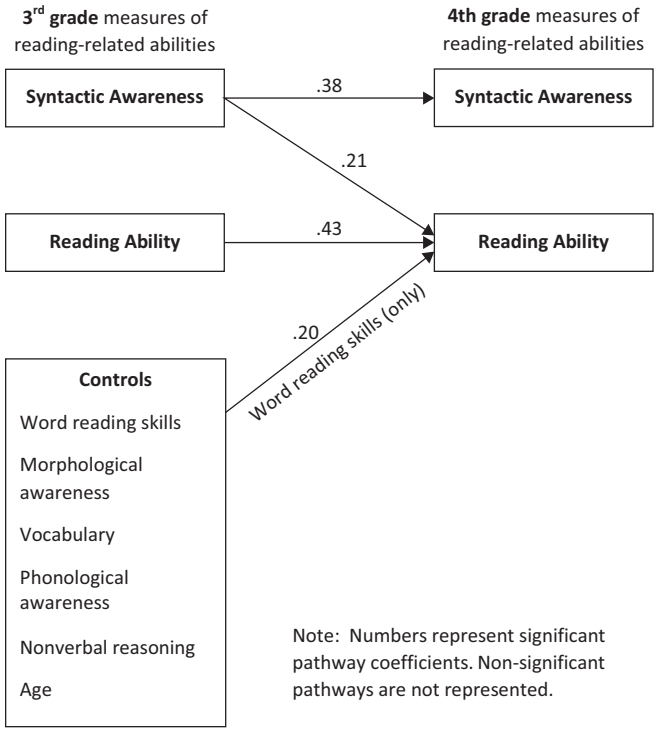
Other topics could have been explored, had space permitted, including working memory, implicit learning, reading comprehension with multiple texts, the development of the strategic reader, the intersection of reading and writing outcomes, and the reading of digital materials for various academic purposes. (See Further Readings at the end of the chapter.) Nonetheless, the studies summarized in this chapter report important outcomes and important insights into the development of reading abilities. Moreover, the studies in this chapter showcase a variety of ways to explore questions, collect information, and conduct research analyses. Finally, these studies introduce a number of major researchers in L1 reading research to the readership of our volume, although there are many other major contributors to the field of L1 reading research.

Beyond the importance of the research described here, we would like to return to an underlying theme of this chapter. These studies all represent ways to tell stories. The researchers (the storytellers) all propose good questions, demonstrate the importance of their questions, provide background information, and explain

the impetus(es) for their studies, thereby setting the scene. The researchers prepare for their studies and plan ways to answer the questions raised. They all go through a series of steps to collect the information needed (like episodes of a story). After collecting information, they analyze it in ways that should help them find answers (much like the final confrontation in good stories). The results are reported and the implications are discussed (akin to the story climax, conclusion, and implied moral). In short, research studies are interpretable as stories. The difficulties that many people face in understanding these stories are due to the compressed and specialized ways the stories are conventionally told, but the stories are important to everyone who wants to know more about reading and how to teach it well.

It is also important to note, in closing this chapter, that research studies and reports of findings often do not impact instruction systemically for many years, or even decades. We hope that these research "stories" lead teachers to explore the instructional implications suggested in Chapters 5 and 6 and to conduct action research projects in their own classrooms (as advocated in Chapters 7–9).

Appendix 3-A: Visual Example of an SEM Pathway Analysis



Adapted from Deacon, S. H., & Kieffer, M. (2018). Understanding how syntactic awareness contributes to reading comprehension: Evidence from mediation and longitudinal models. *Journal of Educational Psychology, 110*(1), 72–86. (This study is showcased in Section 3.4.4.)

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The following are references to areas that could have been covered in this chapter but were not (because of space limitations). See also Chapter 10.

- *Effectiveness of strategy instruction*, see Boardman et al. (2015), Conley (2017), Parris and Headley (2015), Wanzek et al. (2017).
- *Digital reading,* Butcher and Davies (2015), Leu, Kiili, and Forzani (2016).
- *Reading comprehension with multiple texts,* see Beker, Jolles, Lorch Jr., and van den Broek (2016), Bråten, Ferguson, Anmarkrud, and Strømsø (2013), Rouet and Britt (2011).
- *Underlying cognitive skills,* see Cartwright (2015), Cartwright et al. (2015), Ellis (2017), van der Kleij, Groen, Segers, and Verhoeven (2018).
- *Working memory and executive control processing,* see Arrington et al. (2014), Georgiou and Das (2018), Kieffer, Vukovic, and Berry (2013).
- *Resource book on research design and statistical analyses*, see Loewen and Plonsky (2016).

Note

1 See Chapter 10 for a list of the key L1 research studies highlighted in the 1st and 2nd editions of *Teaching and Researching Reading*.

4 Key Studies in L2 Reading

This chapter reviews 10 research studies conducted in L2 contexts. The studies illustrate current methods for conducting research and showcase topics central to reading development in L2 settings, including the following:

- The importance of print exposure and extensive reading for reading comprehension and vocabulary development.
- The role of statistical learning for L2 reading.
- The independent contributions of morphology, syntax, vocabulary, spelling, and discourse structure awareness for L2 reading comprehension.
- The importance of fluency.
- Component skills supporting reading comprehension.
- Issues of language threshold and language transfer.

Conducting research in second language (L2) classrooms has much in common with the research conducted in first language (L1) settings. The topics are often the same, methods and procedures are typically the same, and ways of interpreting the information collected are also mostly the same. There are differences, however. Among these differences in L1 and L2 research are the issues discussed in Chapter 2. For example, L2 research, unlike L1 research, often views the roles of language proficiency and language knowledge as more important factors in reading development (although the impact of language knowledge is taking on a greater role in L1 reading research; see Deacon & Kieffer, 2018; Mancilla-Martinez & Lesaux, 2017; NICHD, 2005; Tighe & Schatschneider, 2014). L2 research often examines transfer of L1 linguistic, strategic, and content knowledge on L2 reading performance and whether this transfer might be positive or negative. L2 research often takes into account the role of L1 reading skills and metacognition (the latter as an underlying cognitive ability) when explaining L2 reading development—in essence, L2 reading researchers view L2 readers as learning to read *with* two languages. Moreover, L2 research frequently examines the issue of a second language threshold, a unique L2 issue.

In the previous chapter, we examined a number of studies that have strongly influenced the field of L1 reading research. Those research efforts have, to some

extent, influenced instruction as well, although the large gap between research and relevant implications for instructional practices is real. Many major research studies have a strong impact on instruction only years after their completion, and often not quite in ways initially proposed by the researchers. One goal of this chapter and the previous one (and of the book overall) is to advocate for stronger connections between research and instruction. Although it is true that some research should not be translated hastily into teaching techniques, it is also true that important ideas stemming from reading research—ideas that would benefit students' learning—are often lost for years. For example, 20 years after research emerged describing the importance of training students to become strategic readers, most L1 and L2 reading instruction still does not focus on strategy instruction in ways that will develop more strategic readers. L2 instruction also does not commonly focus on fluency practice, extensive reading, morphological knowledge, spelling (orthographic knowledge), and motivation and engagement.

We cannot predict ahead of time which research ideas and results ought to influence teaching relatively quickly, but all of us can explore research ideas, claims, and interpretations within our own classrooms. We can, for instance, explore the extent to which an interesting idea developed through research makes good instructional sense when adapted in some way to our classroom settings. The goal is not so much to replicate or refute research claims but rather to see (a) if the claims can fit specific teaching contexts, (b) if they can lead to improved teaching practices and better student learning, and (c) if they can be readily adapted (or adopted) into an already existing curriculum.

This chapter has three major goals along the lines of the aforementioned comments. First, it demonstrates that many of the linguistic factors important for L1 reading research are also important for L2 reading researchers. Second, it outlines and extends major topics that are commonly explored in L2 reading contexts. Third, the chapter presents a number of key L2 reading research studies[1] and, in doing so, introduces ideas for possible instructional applications and even a "curricularization" of good instructional applications.

4.1 Topics to Explore in L2 Reading Research

To organize our discussion of L2 reading research and to represent the range of issues that can be addressed, we have divided our discussion into five distinct, though sometimes overlapping, areas. These areas, listed in Table 4.1, provide us with a convenient way to talk about major issues and key research studies within

Table 4.1 Areas Typical of L2 Reading Research

1. Exposure to print and extensive reading
2. Underlying cognitive skills and statistical learning
3. The contributions of morphology, syntax, vocabulary, spelling, fluency, and discourse structure awareness for L2 reading comprehension
4. The relative impact of component skills on reading comprehension and instructional training
5. The issues of language threshold and language transfer

a manageable framework. We make no claim to any special insights into reading by using this framework, and several important areas of reading are not examined in the following discussion (but are in Chapters 1–3).

The first research topic—exposure to print and extensive reading—includes issues of implicit learning, incidental vocabulary learning, fluency and automaticity, and improved overall comprehension. The second issue follows from extensive reading with respect to implicit learning that involves statistical learning as an underlying cognitive skill. A third research area addresses specific language skills that impact reading abilities across multiple age and grade levels: morphological knowledge, syntactic knowledge, vocabulary knowledge, orthographic knowledge (spelling), and discourse structure knowledge of various types. The fourth research topic centers on combining and comparing component skills and main idea comprehension. The fifth important research topic relates to L2-specific issues of language threshold and language transfer.

Each of the L2 research studies presented (see Table 4.2) represents at least one of the five main groupings of L2 research topics.

4.2 Ten Good Stories from L2 Reading Research

Research conducted in L2 settings contains the same storytelling elements as studies conducted in L1 settings (Chapter 3). Despite the compression and special language typical of research reports (in journals and/or books), all research efforts involve a question (conflict), major efforts by the researchers (main characters), and multiple episodes to reach a final resolution. There may even sometimes be "a moral to the story." We closed most of the studies in Chapter 3 with a story comment. We do not repeat this theme for each study in this chapter. We will, however, return to "the story theme" at the conclusion of the chapter.

We need to emphasize that, like the studies reported in Chapter 3, the studies discussed here are not necessarily "better" than the many other studies that could have been selected. As anyone who has devoted time to L2 reading will understand, certain studies resonate strongly for individual readers. The following studies are among those that we see as important and have influenced our thinking on L2 reading.

4.2.1 A Study of Reading Rate, Reading Comprehension, and Vocabulary Growth through Extensive Reading

Over the past 30 years, many claims have been made, in both L2 and L1 contexts, for extensive reading (i.e., reading large amounts of text material that are within students' reading proficiency levels for enjoyment or for the exploration of ideas for learning purposes). A recent L2 meta-analysis supported this idea as well (Nakanishi, 2015). However, many studies carried out on extensive reading have design flaws or omit important information about how extensive reading was implemented, raising questions about the reported outcomes. The study by Suk (2017) provides a well-controlled and well-designed L2 study offering persuasive evidence that extensive reading can be a powerful support for reading and vocabulary development.

Table 4.2 Research Studies Associated with Different L2 Reading Research Areas

General L2 Research Areas	*Section*	*Studies Associated with Research Areas*
Extensive reading and cognitive abilities impacting reading development	4.2.1	A training study demonstrating the potential of extensive reading (Suk, 2017)
	4.2.2	A trio of studies of new word learning processes using eye-tracking approaches (Malone, 2018; Elgort et al., 2018; Mohamed, 2018)
Statistical learning and background knowledge	4.2.3	A study on statistical learning and L2 reading comprehension improvement (Frost et al., 2013)
	4.2.4	A study on vocabulary learning during an extensive reading program (Webb & Chang, 2015)
Component skills supporting reading comprehension	4.2.5	A study of morphological awareness in ESL reading comprehension (Kieffer & Lesaux, 2012)
	4.2.6	A study of the contributions of vocabulary knowledge and spelling knowledge to reading comprehension (Reed, Petschur, & Foorman, 2016)
	4.2.7	The role of discourse structure graphic organizers on reading comprehension (Jiang, 2012)
Studies on component skills and their impact on comprehension	4.2.8	Early indicators of reading outcomes and the Simple View of Reading (Mancilla-Martinez & Lesaux, 2017)
	4.2.9	A meta-analysis of the impact of component skills on reading comprehension (Jeon & Yamashita, 2014)
L2 language threshold and reading transfer	4.2.10	A study of the language threshold and L1 reading transfer (Yamashita & Shiotsu, 2017)

Quote 4.1

> Reading ability is only likely to develop gradually when L2 learners are continually exposed to abundant meaningful input, or extensive reading. Extensive reading has been proposed as one of the most effective methods for developing reading abilities because it can expose L2 learners to ample amounts of meaningful input, motivate L2 learners to read, and lead to the development of skilled reading abilities.
>
> Suk (2017, p. 73)

Suk first presents a well-argued theoretical explanation for the effectiveness of extensive reading as a major means for promoting implicit language learning in support of reading goals. Reading extensively provides large amounts of comprehensible language input; this input allows for incremental learning of language co-occurrence patterns and associational relations, leading to **implicit language learning** (Ellis, 2015; Frost, 2012; Grabe, 2009). As Ellis (2015) states, "implicit learning is the acquisition of knowledge about the underlying structure of a complex … environment by a process which takes place, naturally, simply, and without conscious operations" (p. 3).

Suk carried out her study with 171 Korean English as a foreign language (EFL) university students from four classes: 88 students were in two control classes, and 83 students were in two experimental classes. The 15-week reading courses for non-English majors met once per week for 100 minutes. The two control classes used a standard EFL reading textbook for the entire time. The two experimental classes used the same textbook for 70 minutes per week (70% of the weekly time) and substituted in an extensive reading course component for 30 minutes per week (30% of the course time). Each of the two experimental classes had a class library of 175 graded readers (with a total of 155 titles). Out-of-class homework involved 2–3 hours of assignments per week for both control and experimental groups. Experimental-group homework included extensive reading with graded readers that students checked out from class libraries. The graded-reader assignments counted as part of the course grade and successful completion of graded readers was based on passing grades on online MReader quizzes (see Robb, 2015) that were available for each book in the class library. Students in the experimental classes were expected to read 200,000 words for 25% of their course grade. Homework assignments for control groups also counted for 25% of the course grade. Many other aspects of the control and experimental class lessons are explained in the study.

A comprehension assessment measure in a standardized format established pre-treatment baselines and post-treatment gains in both reading comprehension and reading rate. A second assessment measure was developed to measure vocabulary baseline and gains, drawing on words from across all 155 different graded readers. Through a complex development process, Suk developed a well-controlled 120-word translation test as the vocabulary knowledge measure.

Experimental class outcomes were compared on gains made between pre- and post-treatment; they were also compared with control classes on three test scores (pre-, post-, and delayed-post). Effect sizes for composite pre- to post-gains for the experimental group were large (d = 1.49), and a large effect size was also found for a composite experimental versus control group comparison (d = .80). The experimental group significantly outperformed the control group on all three reading and vocabulary measures. The reading comprehension effect size for the experimental group over the control was d = .30. For reading rate, the effect size was d = .39. For vocabulary, the effect size was d = .70. The large effect size for vocabulary improvement for the experimental group over the control was much stronger than the results of several prior studies (see also Webb & Chang, 2015).

The large effect size for the vocabulary result reflected a more sensitive testing instrument that focused on higher-frequency vocabulary appropriate for the students' ability levels and was highly reliable. Many prior studies have used the Vocabulary Size or Vocabulary Levels tests (Nation, 2013; Schmitt, 2010), both of which sample a limited number of vocabulary items at many different frequency levels. The gains in reading comprehension, while not as strong as for vocabulary, were also important. In many large-scale training studies, reading comprehension measures that involve "far transfer" to an unrelated standardized testing format do not reach significance in favor of the experimental treatment. In this study, however, the reading comprehension gains are significant.

Additional strengths of this study included (a) the detailed explanation of instruction provided during the 30 minutes dedicated to extensive reading each week, (b) the use of the online MReader program to verify successful comprehension of the graded readers, (c) the large number of available graded readers for student choice, and (d) the integration of an extensive reading component into a larger reading curriculum while still delivering the expected overall instruction.

Quote 4.2

> Overall, this study strengthened evidence for the effectiveness of extensive reading on various areas of L2 learning. The results showed that the extensive reading students developed [significantly better] L2 reading abilities [than the control group], and especially increased L2 vocabulary acquisition, even though only 30% of the class time was used for extensive reading instruction. The findings suggest that extensive reading can be readily incorporated into existing L2 curricula without major changes to the curricula.
>
> Suk (2017, p. 88)

This particular study involved years of preliminary work through pilot studies, arrangements to teach courses at a Korean university, careful controls to ensure treatment validity, and appropriate statistical analyses. It is a captivating story that demonstrates the importance of careful planning and determination to answer some critical questions on the effectiveness of extensive reading embedded within a more standard curriculum framework.

4.2.2 Three Related Studies of the Role of Incidental Word Learning during Extensive Reading

It is not often that three related studies, by different researchers, examining incidental word learning appear in the same year in the same journal (*Studies in Second Language Acquisition*). The three studies (Elgort et al., 2018; Malone, 2018; Mohamed, 2018) used a variety of research measures and statistical procedures, but all examined processes of initial new word learning and two studies used eye-tracking approaches to gain new perspectives on word learning. The process of reading and exposure to print reveals likely word-learning processes by

which words first become recognized as word forms, then acquire meanings, and then are learned for recognition and recall purposes. The eye-tracking approach complements the incidental word learning process that is commonly employed in word-learning research. In much prior research, the amount of reading, the number of new words that learners are exposed to, and the number of times that each word is encountered are all associated with the number of new words learned based on subsequent testing.

Quote 4.3

> Each contextual encounter with a word results in a memory trace of this word plus its context. After multiple encounters with the same word in new diverse contexts, aspects of memory traces that overlap across encounters are reinforced…. Eventually a core meaning of a word is abstracted from multiple contextual encounters and is incorporated into a word's representation.
>
> Elgort et al. (2018, p. 343)

The three studies all followed up on an initial study by Pellicer-Sánchez (2016). Malone (2018), in one part of a well-controlled study, involved four groups of 20 intermediate-level ESL students in pre-university programs. All groups read a set of four passages that varied in low-frequency word occurrences and by whether students simultaneously heard the passages that they were reading. Two passages included eight very-low frequency words *two* times, and two passages included eight very-low frequency words *four* times. The students in all four groups read 32 low-frequency words in total. Passage order was counterbalanced among groups, as was the number of low frequency word repetition (two times or four times). Each group had (a) two passages with two repetitions of low-frequency words and (b) two passages with four repetitions. Every student also listened to two passages with audio support and two passages without audio support. They all read the passages under controlled reading time conditions on a computer; they were also told to focus on comprehension tasks.

Results showed that when students read the passages with two exposures to low-frequency words, they (a) recognized the form of these very uncommon words significantly above chance in a post-reading form-recognition measure and (b) performed well above chance on a form-meaning measure. There was further improvement in incidental word learning when students were exposed to four occurrences rather than two occurrences. Overall, this study highlights the rapidity of word-form and word-meaning gains after only a few exposures to new words.

Elgort et al. (2018) carried out a similar study of **incidental learning** to observe how new words were recognized by 40 advanced university students. They used eye-tracking technology to observe the length of eye-fixation time on key words while students read a long, advanced-level article (12,152 words) over two days. The goal was to examine the impact of the number of exposures on 14 unknown

words in an extended incidental exposure context (contextual word learning) that approximated real academic reading demands faced by L2 university students (in Belgium). The text also had 14 designated control words that were matched with the unknown words to set baseline times when reading familiar words.

The use of eye-movement processing while students read the text provided more sensitive measures of changes in word recognition with each exposure to target words (up to 40 exposures for some words). Elgort et al. found that students gained word-form recognition quickly based on decreasing eye-fixation times. Within 6–8 exposures to a target word, subjects' eye-movement patterns approximated the patterns seen with more common, familiar words.

The researchers examined whether word-meaning recognition would also improve over the first eight exposures. They found that target-word processing became more like familiar-word processing based on two specific eye-movement measures related to lexical access: "go-past time" and "total reading time." Go-past time measures report all of the time looking at a word before moving to the next word—including brief regressions within the word, regressions back to prior words, and then refixations on the word. Total reading time measures include all the time fixating on the word and includes going back to the word once having gone past it.

Quote 4.4

> On all eye-movement measures, there was a significant interaction between [the number of] occurrences and word type [target words vs. familiar words], confirming statistically that the differences in reading of the target and control words reduced significantly by the eighth occurrence in the text. These results show that both lexical access and word-to-text integration of the target words became more like those of the control words by the eighth occurrence.
>
> Elgort et al. (2018, p. 355)

In a further analysis, Elgort et al. explored incidental word learning through a comparison of target-word eye movements during the last contextual exposure while reading the text versus an out-of-context sentence-reading measure of target-word learning after finishing the reading of the text. The post-reading out-of-context eye movements were significantly different from the final contextualized eye-movement result when compared on four eye-fixation timing measures (all involved longer fixation times during the post-reading out-of-context phase). These results suggested that decontextualized target-word reading processes were not as firmly fixed as they are with familiar control words. A measure of the decontextualized post-reading, word-meaning recall also indicated that the word-meaning connections were not as strong as meaning generation for familiar words (34% accuracy versus 99% accuracy). Nonetheless, a 34% accuracy rate gain on a meaning-recall measure (more demanding than meaning recognition) with unknown words is larger than many similar post-reading word recall measures in

prior research. Overall, the results of this carefully controlled study indicate that new word forms and new word meanings are learned through multiple incidental exposures in extended reading in very advanced reading contexts.

Finally, Mohamed (2018) carried out a similar carefully designed study of incidental word learning with 42 advanced English as a second language (ESL) learners in a U.S. university setting. He also used eye-movement measures of processing while students read an easy graded reader (5,400 words) in one session (45–70 minutes). Two versions of the reader were created with 20 **pseudo words** replacing different familiar words in each version of the graded reader. Making two versions minimized the chance that one version of the graded reader inadvertently might have provided unforeseen supporting contexts for acquiring pseudo-word meanings. Learners were expected to focus on a set of comprehension measures at various points while reading the story to ensure that vocabulary learning would be incidental. Students read the graded reader on computers that were set up with eye-tracking programs. The students also took three post-reading measures of vocabulary gains with the pseudo words (form recognition, meaning recognition, meaning recall).

Results showed that the pseudo words had longer (but gradually decreasing) "gaze-duration time" and longer "total-fixation time" for the first 12 exposures; thereafter, pseudo words and familiar words started to show similar processing times. The results of a second analysis showed that both "total reading time" during eye tracking and "number of exposures" were strong significant predictors of vocabulary gains on all three post-reading vocabulary measures. A third analysis showed that, after controlling for number of exposures, total exposure time for individual pseudo words during eye tracking was associated with word learning on all three post-reading vocabulary measures. That is, more total reading time fixated on a given pseudo word led to improved vocabulary learning of that word. As a final finding, specific eye-fixation measures, aside from total fixation time, predicted different vocabulary gains. That is, the "first fixation time" on pseudo words predicted form-recognition vocabulary gains, and gaze duration (first and subsequent fixations while still on a word) predicted word-meaning recall.

Quote 4.5

> The results of the study are most clearly relevant to second language vocabulary learning and teaching. Maximizing exposure to vocabulary in rich contexts is a recommended strategy to ensure the best conditions for internalizing partially known words or acquiring new vocabulary…. The present study corroborates previous research on the role of extensive reading in creating possible opportunities for learning new vocabulary. One relevant implication for extensive reading is that it can afford more familiarity with new lexical items, although this does not guarantee successful internalization of new word meanings in a limited time frame. This is particularly true because the effects of extensive reading are longitudinal in nature.
>
> Mohamed (2018, p. 287)

Like chapters in a good book, together these three studies on incidental vocabulary learning highlight both similarities and variations in outcomes. The three studies involved different research measures, texts, amounts of exposure, and experimental subjects, but they all involved the study of incidental word learning while reading. There is a remarkable convergence across these three studies (see also Pellicer-Sanchez, 2016). These researchers all strongly argued that incidental exposures to new words lead to new word learning over time and from multiple exposures. As a corollary to these studies, Laufer and Aviad-Levitsky (2017) have argued persuasively that word-recall measures in research studies are too demanding as a measure of vocabulary knowledge and vocabulary gains while reading. Instead, word-recognition measures (eliminating meaning-production demands) are more appropriate predictors of reading comprehension (and more appropriate for word-knowledge gains related to reading).

4.2.3 A Study on Statistical Learning and L2 Reading Comprehension Improvement

Earlier chapters in this volume have introduced the idea that statistical learning is a very important, even if seemingly invisible, factor in reading development. A number of studies have appeared in the past decade pointing out the underlying importance of statistical learning in many areas of L2 learning (see Ellis, 2015, 2017; Ellis & Wulff, 2015; Hamrick, 2014; Hulstijn, 2015a; Misyak & Christiansen, 2012). In line with the exploration of the role of statistical learning for L2 acquisition, there has also been a greater recognition of the need for practice and exposure to language forms and language-use tasks (DeKeyser, 2015).

Quote 4.6

> When we use language, we are conscious of communicating rather than of counting, yet in the course of conversation we naturally acquire knowledge of the frequencies of the elements of the language…. When you read, you never consciously count bigram frequencies [2-letter sequences]. You never have done. When you listen, you never consciously tally phonotactic sequences [allowable consonant clusters]…. Nevertheless, since our processing systems are sensitive to these statistics across the whole gamut of language, we must have naturally acquired this knowledge of the frequencies of the elements of language, their transitional dependencies [patterns of sequential co-occurrences] and their mappings in the course of language use. These aspects of language learning therefore must reflect implicit learning.
>
> Ellis (2015, p. 6)

The study presented here examines the role of statistical learning specifically as it applies to L2 reading development. Frost, Siegelman, Narkiss, and Afek (2013) examined whether or not assimilating the statistical structure of a basic language pattern relevant to reading would associate with reading development. In

Hebrew, almost all content written words consist of a three-consonant sequence that provides a basic indication of the word's meaning. This is a fundamental building block for learning Hebrew words. In their study, 27 American students in the first year of a Hebrew learning program in Israel carried out a very simple Visual Statistical Learning (VSL) task, in which 24 fairly complex shapes were organized into eight triplet sequences, always appearing in the same order. All 24 shapes were presented on a screen one at a time in a 10-minute stream. Learners were then shown two triplets of shapes and asked to indicate which sequence had appeared in the training as a sequence.

All learners also took three Hebrew language word-knowledge assessments: a pseudo-word decoding task, a naming accuracy task, and a morphological priming task (responding faster to forms that indicated morphological information). Learners who performed better on the three language assessments also performed better on the VSL task, generating significant correlations (r = .57 for decoding; r = .43 for naming accuracy; r = .57 and r = .44 for two morphological priming scores). All these correlations were based on the relationship between recognizing visual triplet forms and language assessments that drew upon the three-consonant structure of written Hebrew words.

Quote 4.7

> [These correlations] suggest that a common faculty underlies performance in a task that taps the implicit learning of transitional probabilities of a stream of visual shapes and a series of measures that tap the acquisition of the deep linguistic structures characteristic of a given language…. Cognitive systems are tuned to seek correlations in the environment and the implicit assimilation of event co-occurrences is the basis of many different types of learning. The linguistic environment is no exception. Languages and their writing systems are characterized by idiosyncratic correlations of form and meaning, as they are picked up in any other type of learning, for the purpose of making sense of the environment.
>
> Frost et al. (2013, p. 1250)

Statistical learning studies have a fairly long history in cognitive psychology. More recently, they have become more prominent in language acquisition studies. The emergence of theories of language learning, such as usage-based learning, provide compelling evidence for the power of underlying cognitive skills that support implicit learning of language words and structures, and they strongly support literacy acquisition.

4.2.4 A Study of the Effect of Prior Vocabulary Knowledge on the Learning of New Vocabulary during an Extensive Reading Program

One of the issues around new word learning is the extent to which levels of prior word knowledge, as one type of background knowledge, impact the learning of

new words. The impact of background knowledge on word learning is sometimes examined with obviously differing levels of cultural knowledge across two distinct cultural groups or by comparing novices and experts in a professional or academic domain. The study by Webb and Chang (2015), in contrast, examined the extent to which exposure to new words, through an extensive reading program, would lead to new word learning depending on the level of prior language knowledge. A number of earlier L2 studies provided evidence that more advanced prior word knowledge leads to better new word learning (Elgort, Perfetti, Rickles, & Stafura, 2015; Pulido & Hambrick, 2008; Tekmen & Dagloglu, 2006). The specific value of the present study is that it is a longitudinal training study involving incidental vocabulary growth while students are engaged in a two-term, 37-week extensive reading program.

Webb and Chang (2015) carried out a training experiment in which 60 EFL secondary-school students in Taiwan were first divided into high-, intermediate-, and low-level groups based on two vocabulary tests administered at the beginning of training. Over 37 weeks, students read 10 level-one graded readers (semester one) and 10 level-two graded readers (semester two) as the basis of their reading courses. All graded readers were taught as class sets; in this way, the teacher could provide greater support for students' comprehension and more opportunities to clarify misunderstandings (but no vocabulary support was explicitly given to the class). Two sets of 100 words were chosen from each level of 10 graded readers (i.e., level-one readers and level-two readers). These sets of words represented words from the first 1,000 word level (33 words), the 2,000 word level (32 words), and words from the 3,000 word level (35 words). (See also similar method by Suk, 2017, this chapter; see Further Reading at the end of the chapter for a link to word lists.)

Students were tested on these words on three occasions using multiple 10-word matching sets (from L2 words to L1 synonyms) and the Vocabulary Levels Test. Testing took place before the course began, at the end of the semester, and five weeks after the semester ended. The same process was repeated in the second semester for the 10 level-two readers and a new set of 100 target words drawn from the level-two readers. Again, testing was done at the beginning of the semester, at the end of the semester, and several weeks after the end of the semester.

Vocabulary knowledge gains were generated as relative gains on the words not known at the beginning of each semester. In semester one, at immediate post-test time, high-level students, mid-level students, and low-level students had relative gains of 63%, 45%, and 28%, respectively. Gains from pre- to post-test were significant as were group differences in gains comparing high-level students with low-level students. Scores on the delayed post-test showed minimal losses in vocabulary knowledge from the post-test scores. The pattern was repeated for the second semester, with high-level students again learning the largest number of new words and low-level students learning the fewest new words (relative gains for the three groups, from high to low, 64%, 41%, and 20%). However, in all cases, the students made significant relative gains in new-word knowledge as seen on the post-test and delayed post-test. The greater gains by high-level students

also support the generalization that students who know more words to begin with will be more efficient at learning new words. How much a student knows at the outset can be a strong predictor of the number of new words acquired through incidental learning.

Quote 4.8

> The impressive gains made by the high-level participants provide strong evidence that extensive reading can be an effective approach to developing L2 vocabulary knowledge, however, the differences between the gains of the high- and low-level participants indicates that large gains in vocabulary knowledge cannot be generalized to all learners in extensive reading programs.
>
> Webb and Chang (2015, p. 66)

Over decades, there have been many challenges to the arguments that new words are learned through incidental exposure during extensive reading. The results of the aforementioned eye-tracking studies and the study here by Chang and Webb provide persuasive evidence that word learning does occur through extensive reading.

4.2.5 A Study of the Role of Morphological Awareness in ESL Reading Comprehension across Three L2 Groups of Learners

In the studies showcased in sections 4.2.1–4.2.4, we have seen that incidental word learning through reading exposure, underlying statistical implicit learning, and greater background knowledge are likely to play important roles in L2 vocabulary learning and reading comprehension. In the next three studies, we look at the role of specific component skills in predicting performance on reading comprehension. These studies explore new insights into the roles of morphology, spelling, and discourse structure awareness. At the same time, vocabulary knowledge is almost a constant as a critical component skill supporting L2 reading abilities.

A number of recent studies on the role of morphological awareness have strengthened the assertion that morphological awareness is an important component skill for reading, both for its direct contribution to reading comprehension and for its indirect contributions supporting other critical component skills. The role of morphological awareness applies to both L1 and L2 contexts (L1: Deacon, Kieffer, & Laroche, 2014; Goodwin, Petscher, Carlisle, & Mitchell, 2017; Nagy, Berninger, & Abbott, 2006. L2: Jeon, 2011; Kieffer, Biancarosa, & Mancilla-Martinez, 2013).

In the study reported here, Kieffer and Lesaux (2012) examined the contribution of derivational morphology to reading comprehension for three groups of language minority 6th graders (Spanish L1, Filipino L1, and Vietnamese L1) who have all had English medium instruction from the beginning of their schooling.

A fourth group of English L1 students were also included. Students (n = 952) were given two tests of reading comprehension, two tests of morphological awareness, a test of vocabulary knowledge, and a test of silent word fluency. All students had similar socio-economic status (SES) profiles.

Quote 4.9

> A large number of English words are constituted from two or more smaller meaningful units or morphemes, such as prefixes, suffixes, and roots …. It is unsurprising that morphological awareness, that is, metalinguistic understanding of how such words are formed, has been found to correlate with [students'] reading comprehension ability …. Given the linguistic nature of these processes, they may proceed differently for students from homes in which a language other than English is spoken …. Few studies have investigated whether the direct and indirect contributions of morphological awareness to reading comprehension differ between native English speakers and [language minority] learners. Similarly, it is unknown how these contributions might be similar or different for [language minority] learners who are exposed to differing home-language morphological systems.
>
> Kieffer and Lesaux (2012, p. 1171)

Kieffer and Lesaux carried out a multiple-group structural equation model (SEM) to identify the significant independent relationships between morphological awareness and reading comprehension directly as well as indirectly, as mediated by vocabulary knowledge and word fluency skills. The best fit model showed (a) a significant direct relationship between morphological awareness and reading comprehension for all groups combined (path coefficient of .48) and (b) significant mediated relationships through vocabulary to reading comprehension (for each of the four language groups, .23, .18, .22, .24). The latter result shows the strong impact of morphology on both reading comprehension and vocabulary knowledge. Vocabulary also showed a significant direct relationship to reading comprehension for all groups combined (path coefficient of .38).

A further important finding of this study is that L1 differences in the students' backgrounds played little role in creating potential variation on model fit. Students from all three differing L1s followed the same patterns of relationship between English morphological awareness and reading comprehension even though all three L1s have different morphological systems and all differed from English. The key predictor for these 6th grade students is the role of the English morphological system on English reading comprehension.

Quote 4.10

> Our findings suggest that morphological awareness contributes directly to reading comprehension as well as indirectly via its contribution to reading vocabulary. These relationships

> were found to be similar for native English speakers and for [language minority] learners from Spanish-speaking, Filipino-speaking, and Vietnamese-speaking backgrounds. These findings support a small but growing body of research that highlights the importance of morphological awareness to reading outcomes across languages.
>
> Kieffer and Lesaux (2012, p. 1197)

This study examined the relationships between L2 morphological awareness and L2 reading comprehension; results demonstrated that morphological awareness was a powerful predictor of L2 reading independent of vocabulary knowledge and word reading fluency. This finding converges strongly with the results of Goodwin, Petschur, Carlisle, and Mitchell (2017) for L1 7th and 8th grade students. Together they tell a captivating story of the role of English morphological awareness and its role in reading comprehension.

4.2.6 A Study of the Contributions of Vocabulary Knowledge and Spelling to Reading Comprehension of Adolescents

One of the more recent re-appearing linguistic skills that have become a focus of reading research is the role of spelling as a predictor of reading ability, especially for older students and adults. L1 research by Andrews (2015), Andrews and Lo (2012), and Ehri (2014) have redrawn attention to the potential importance of spelling for reading comprehension.

The role of spelling as a predictor of reading ability has remained mostly a hidden one, particularly with the rise of the Simple View of Reading (SVR). The SVR usually assumes that reading comprehension is a combination of listening comprehension (oral language skills) and word recognition skills. The SVR predicts best with younger readers. However, older students have almost all reached automaticity in word recognition, and oral language vocabulary is not as relevant when many more academic words are encountered only in their written form. For these reasons, reading comprehension for older students may be better measured through written tests of vocabulary knowledge and spelling knowledge (as a replacement for the orthographic aspect of lexical knowledge). Morphological knowledge is also likely to be a good replacement for word recognition measures with older learners.

Perfetti (2007) has argued that more precise, high-quality lexical representations of words are evidenced by more accurate spelling. The results of previous research have shown that students remember words better when spellings are shown as the words are learned than when words are practiced only orally (Ehri, 2014; Reed, Petschur, & Foorman, 2016, pp. 636–637). Despite this theoretical reasoning, models of reading for adolescents do not typically measure the relationship of spelling to reading comprehension or vocabulary development.

Quote 4.11

> College students' (average age of 19.1 years) vocabulary and spelling abilities were found to make unique contributions to their lexical retrieval (Andrews & Lo, 2012). In the present study, we were interested in how vocabulary and spelling abilities uniquely and jointly explain the reading comprehension performance of students [both L1 and L2] in grades 6-10.
>
> Reed, Petschur, and Foorman (2016, p. 634)

In a key L2 study by Reed, Petscher, and Foorman (2016), the researchers examined the impact of both vocabulary and spelling knowledge on L1 and L2 students' reading comprehension in grades 6 through 10. This study represents a variation on Perfetti's Lexical Quality Hypothesis in that reading comprehension depends on lexical knowledge as well as the orthographic, phonological, and semantic constituents of lexical items. With older students, phonological knowledge is automatized among L1 students and most L2 students who have been in the U.S. school system. Variations in orthographic letter knowledge disappear as a measure of basic word recognition with advanced L2 students, but spelling represents an orthographic skill that is more advanced when students begin to encounter less common words and cannot rely as much on sight word reading of these new words. In a sense, spelling is an advanced form of orthographic knowledge as it applies to less common and more derivationally complex words.

Reed, Petschur, and Foorman collected vocabulary, spelling, and reading assessments from 2,813 students across grades 6 to 10, including both L1 and L2 students. All measures were taken from the Florida Comprehension Assessment Test (FCAT). The reading comprehension measure involved 6 to 8 passages with 13 questions for each passage. The word analysis portion was a well-designed spelling test. The vocabulary knowledge task combined knowledge of written forms of less frequent words and morphological awareness. Correlations between spelling and reading comprehension across the five grades ran from .44 to .54. Correlations between vocabulary and reading comprehension across the five grades ran from .50 to .62. Regression analyses across the five grades showed that vocabulary and spelling knowledge accounted for more variance in reading comprehension for L2 students (60% to 40%) than for L1 students (48% to 36%). In all grades, the two predictors (vocabulary and spelling knowledge) together were very strong predictors of reading comprehension. For L2 students, vocabulary was a much stronger predictor; for L1 students, vocabulary and spelling became almost equal predictors for grades 9 and 10.

An SEM was also generated for each grade level (grades 6–10, combining L1 and L2 students at each grade). The five SEMs examined the relationship of vocabulary to reading directly and also measured the impact of vocabulary on reading indirectly through its impact on spelling. Spelling was also included as a direct measure of reading ability. Overall, the results of the analyses by grade

level showed that both vocabulary and spelling made unique contributions to reading scores. But across grades, the strength of prediction made by vocabulary and spelling on reading varied. By grade 10, spelling was a much stronger predictor of reading comprehension than for grade 6. Across the five grades, the direct unique contributions of vocabulary at each grade were strong predictors but decreased somewhat from grade 6 (path coefficient of .59) to grade 10 (.46).

In all cases, as reading scores increased, the impact of vocabulary and spelling remained as consistently positive predictors of reading performance. The positive growth in all three variables from grade to grade suggests that students at each higher grade improved the quality of their lexical representations as they improved their reading ability. *Vocabulary* was the stronger predictor of reading ability across grades and across language groups, accounting for more unique variance at each grade level. Although the impact of *spelling* on reading was less strong (path coefficients from .15 to .30), it contributed positively to reading ability at each successive grade and was stronger at higher grades (grade 9 path coefficient at .27, grade 10 at .30).

Quote 4.12

> Results of this study suggest that the middle and high school years may be important periods of continuing growth of students' vocabulary and orthographic knowledge [spelling] …. The results of the mediation model in the present study also indicate that spelling may be necessary to capitalize on vocabulary knowledge when reading higher grade-level text …. [L2 students] likely will need instruction more appropriate to earlier stages of spelling and vocabulary development …. Targeted and systematic instruction in these skills may be a critical element of remediating the elevated risk [that L2 students] display for reading comprehension problems.
>
> Reed, Petschur, and Foorman (2016, p. 652)

The bottom line (or moral of the story) is that vocabulary and orthographic knowledge (spelling) continue to play roles as strong predictors of reading ability throughout secondary school grades in the U.S. This conclusion lines up well with expectations of Perfetti's Lexical Quality Hypothesis and suggests ways to develop an augmented Simple View of Reading (written vocabulary for listening comprehension and spelling for word recognition) for secondary-level students.

4.2.7 The Role of Discourse Structure Graphic Organizers on Reading Comprehension

A third relatively innovative yet important predictor of reading development considered in this chapter is the contribution of **discourse structure awareness** (also referred to as **text structure awareness**) to reading comprehension. Since the 1980s, reading researchers have been exploring the role of discourse structures (or text structures) in reading abilities (Jiang & Grabe, 2007; Meyer,

1985; Mohan, 1986; Pearson & Fielding, 1991). In L1 contexts, a number of studies have examined the impact of discourse structure awareness in some depth, emphasizing top-level discourse structures (Meyer & Poon, 2001; Meyer & Wijekumar, 2012, 2017; Pao & Williams, 2015; Williams et al., 2016). In L2 contexts, the role of discourse structure awareness has been studied much less.

Discourse structures are patterns of organization that are used to convey information in a coherent manner. They are relatively few in number and recur regularly across texts in various combinations and embeddings. These structures include cause–effect, chronology, classification, comparison–contrast, definition, description, for–against, problem–solution, and procedure (sequence). The finite number of recurring patterns (especially in expository texts) makes it possible to raise students' awareness of these patterns. The major benefits for students are that these discourse structures can be explicitly taught and that they support reading comprehension.

Quote 4.13

> Studies on expository prose comprehension have demonstrated that discourse structure awareness plays an important role in reading comprehension in the first language (L1) and the second langauge (L2). The acquisition of discourse structures "occurs only through formal training and substantial reading experience" (Koda, 2005, p. 139) …. One way to translate discourse structures from texts to classroom instruction is through the use of graphic organizers *that represent the discourse structures of the text*. **Discourse structure graphic organizers** (DSGOs) are instructional techniques that display discourse structures and content information visually and hierarchically.
>
> Jiang (2012, p. 85, italics in original)

The key aspect of discourse structure graphic organizers (DSGOs), unlike general graphic organizers (e.g., outlines, Venn diagrams, semantic maps), is that DSGOs explicitly show relationships among informational parts of a text. With DSGOs, students (a) see these relationships clearly, (b) make connections between the text structure and linguistic cues (e.g., transition words; words signaling comparison, problem, or cause), (c) develop an awareness of recurring patterns when explicitly guided in identifying them across multiple texts, and (d) use these patterns of organization in their own summaries and other writing tasks. Such an approach is also consistent with the idea that implicit learning and statistical learning can be assimilated from patterns seen in repeated exposures of language input.

In L2 contexts, Jiang (2012) is the first researcher to use multiple specific DSGOs in longitudinal training research. Jiang carried out a 17-week training study involving the use of DSGOs within standard EFL university reading courses in China. Twelve classes of both first-semester (n = 174) and third-semester (n = 166) students were randomly assigned to experimental and control groups. (Three freshman classes and three sophomore classes were experimental, and

three each were controls.) The standard curriculum at freshman and sophomore levels comprised intensive reading instruction with close reading of texts and intensive grammar instruction (in four 45-minute classes per week). Each level had its own EFL reading textbook. All students took the same type of summative assessment at the end of the semester (different for freshmen and sophomores). Experimental sections covered the standard course work, with the same textbooks as control classes, for 75% of course time. (Experimental students were fully accountable for the standard curriculum material.) The remaining 25% of course time was the experimental component, focusing on discourse structure awareness instruction.

Jiang developed DSGOs for all 20 texts in the textbook at each level. (See Appendices 4-A and 4-B for one complete and one instructional DSGO, developed for an L2 textbook reading passage; see also Appendix 8-A for a sampling of DSGO types.) Experimental instruction comprised one 45-minute class meeting per week. All students completed a pre-test of reading comprehension (from one of three unpublished TOEFL forms) and took one of three researcher-designed DSGO pre-tests with 20 gaps to be filled in. Other forms were used as post-tests and delayed post-tests in a pseudo-random counter-balanced design. Other standard designs of a training experiment were followed: controls on teacher variation, fidelity checks on each classroom, teacher interviews, classroom observations, and controls on test administration.

At post-training time, students took another version of the TOEFL reading test and another version of the DSGO assessment instrument in a counter-balanced design. Results showed that the experimental students at each level (semester 1 and semester 3) performed significantly better on the near-transfer measure based on filling in a DSGO. The results showed a large effect size between groups for the DSGO assessment (d = .82). The experimental students also performed significantly better in the far-transfer reading comprehension measure (TOEFL reading comprehension). The effect size for group differences was small to medium (d = .38). It should be noted that any sign of significant difference on a far-transfer measure of reading comprehension is uncommon. On delayed post-test measures (seven weeks later), the difference between groups on the DSGO measure was still significant. However, there was no longer a significant difference between groups on the third counter-balanced TOEFL reading measure.

A further set of data was generated that adds insights to this training experiment. The university required four university achievement tests, one every four weeks, for all class sections. Even though the experimental group had less class time on standard coursework (75% versus 100%), they performed significantly better than control classes on the objective components of the achievement tests from the first test to the last test (at the end of the semester). A final key finding of the study is that DSGOs can be incorporated into standard EFL reading curricula and not harm student improvement on standard curriculum measures of reading ability. Results of this study (a compelling story for researchers and students alike) suggest that experimental students' intensive reading abilities actually improved more than control students', with less time engaged in standard

instructional practices and more time engaged in developing discourse structure awareness.

Quote 4.14

> The current study has a number of implications for materials developers and classroom teaching. First … , this study successfully integrated DSGO instruction into an existing university curriculum by constructing DSGOs to reflect the discourse structures of each passage in the textbook. It has shown that principles and basic designs of DSGOs can be applied to a wide range of instructional texts …. Second, the principles and basic DSGO designs can be taught to teachers through a brief training period …. Third, active involvement by the students is critical to learning the DSGOs effectively …. By working on partially completed DSGO tasks, the students were compelled to engage at a deeper level of information processing.
>
> Jiang (2012, pp. 98–99)

4.2.8 A Study on Early Indicators of Later Reading Outcomes and the Simple View of Reading

The SVR is a major model for explaining the development of reading comprehension for both L1 and L2 students (Geva & Farnia, 2012; Oakhill & Cain, 2012; Verhoeven & van Leeuwe, 2012). As described elsewhere in this chapter and in Chapters 1 and 2, the SVR asserts that reading comprehension skills are predicted to a large extent by some combination of word recognition abilities and listening comprehension (and the comprehension part is often interpreted as oral language comprehension abilities). Recently, a number of studies has examined these two major predictors of reading comprehension more carefully to see if their impact on comprehension changes as students advance to higher grades in school (e.g., Reed, Petscher, & Foorman, 2016, this chapter). But very few studies have tracked these possible changes through longitudinal studies that extend beyond elementary grades, when reading comprehension expectations in schools change considerably (e.g., the research of Mancilla-Martinez & Lesaux, 2010, and Farnia & Geva, 2013, stops at 6th grade; see also Kieffer, 2011). Finally, employing early-grade measures to predict later reading skills is important as a way to consider the most effective instruction at early grades.

Quote 4.15

> Many students whose first language is not English, referred to here as language minority (LM) learners, struggle to comprehend English text more so than their native-English-speaking peers …. Although efforts to better understand factors that relate to LM learners' reading outcomes have increased over the years, extant reading development research has

> generally focused on the word reading rather than the reading comprehension domain …. Given that the language demands of text increase across the school years … , we need empirical investigations of whether early language and literacy skills exert similar or differential impact on reading comprehension outcomes over time, through the elementary and middle school years.
>
> Mancilla-Martinez and Lesaux (2017, pp. 428–429)

Mancilla-Martinez and Lesaux (2017) carried out a nine-year longitudinal study that involved 148 language minority students from kindergarten through 8th grade. Key to their study is the early measurement of a range of language skills (e.g., oral vocabulary, word identification) to examine the extent to which these early measures predict reading comprehension abilities in 5th grade and then in 8th grade. Would all measures remain equally influential in explaining reading abilities in both grades 5 and 8? Or would some skills become more and others less influential between grades 5 and 8? The SVR would predict that both word recognition and oral language comprehension skills would contribute to later reading comprehension skills. The researchers' longitudinal study wanted to test this assumption by following the same Spanish-speaking language minority students for nine years. They also wanted to see if students' Spanish L1 language skills would impact English reading abilities in later grades.

The researchers first collected a battery of language and literacy measures during kindergarten, 1st grade, and 2nd grade, including (a) picture oral vocabulary naming in both English and Spanish, (b) verbal short-term language memory in both English and Spanish (tapping syntactic and semantic knowledge), (c) word-reading skills in both English and Spanish, (d) dictation of words and phrases in both English and Spanish (measuring spelling and writing skills), and (e) English reading comprehension tests in grades 5 and 8. They also included measures of SES and home-language use.

The researchers then used a factor analysis to find the best groupings of all measures. The best factor structure was a two-factor solution with all of the English measures on factor 1 and all of the Spanish measures on factor 2. This outcome suggests that all testing measures were language dependent, measuring either English or Spanish. As an example, there were no groupings of measures that separated word-level assessments versus oral language. Language background (Spanish or English) was the dominating difference.

In follow-up factor structure analyses, Mancilla-Martinez and Lesaux then grouped language skills performance for kindergarten, 1st grade, and 2nd grade. For each grade, English scores for vocabulary and verbal memory (as *language skills*) were a separate factor from Spanish vocabulary and verbal memory. The same outcomes were found for factor structures that sorted word-recognition skills and dictation, as *literacy skills* (English versus Spanish).

These factors for language skills and literacy skills were then combined into overall variables for (a) English literacy skills and language skills and (b) Spanish

literacy skills and language skills. These four composite variables (English language, English literacy, Spanish language, Spanish literacy) were then used in regression analyses to explain performance, four and seven years later, on 5th grade reading abilities and 8th grade reading abilities. Classical regression (using the whole group of students) and quantile regression (students sorted by proficiency levels, such as how students at 10th, 25th, and 50th percentiles performed) were carried out. We report only the results of the classical regression analysis here.

The regression analysis on 5th grade reading comprehension showed that early word-recognition skills in English were the only strong predictor of English reading comprehension. Spanish word skills made a small independent contribution to English reading comprehension only at the kindergarten level. With the regressions on 8th grade reading, both early English literacy (word recognition and dictation) and early English language skills (vocabulary and verbal memory) from kindergarten through 2nd grade independently predicted 8th grade reading comprehension outcomes. When the 5th grade reading scores were added to the regression on 8th grade reading comprehension first (as an autoregressor, making it harder for sub-skills to make independent contributions), English language-based skills in 1st and 2nd grades were still significant predictors. English word-based literacy skills diminished and were no longer significant predictors of 8th grade reading. The most important finding of these regressions is that word-recognition skills and language skills in English are both important predictors for 5th grade reading, but only the language skills composite is a significant predictor of reading in 8th grade after the 5th grade reading autoregressor is used.

This research study provides many valuable insights, but the big picture is most important. First, there was a major change in early sub-skills predictors on reading depending on whether one looks at 5th grade or 8th grade (thus the importance of longer longitudinal studies). If one was analyzing with only 5th grade data, it would seem that only word-reading skills predict reading performance (and reading difficulties at 5th grade). But if one continues analyzing for three more years, to 8th grade, then it is the language-skills composite that is the only significant predictor explaining how students performed in reading. This suggests that the SVR shifts strongly from word-reading skills to language skills (essentially vocabulary and syntax knowledge in this case) by the time that language minority students reach 8th grade.

A second major finding is as follows: language minority students struggling with reading in elementary- and middle-school grades can be identified in part by word-recognition skills and language-skills diagnostics administered in early grades. Knowing that word-recognition skills could be a problem in 5th grade and that language skills could be a problem in later grades, both word recognition and language skills (especially vocabulary) can be focused on in earlier grades rather than having language-skill deficits become overwhelming problems for language minority students in later grades.

Finally, Spanish early word-recognition skills and language skills did not have a major impact on English reading comprehension at either 5th or 8th grade.

Students, in English-only instructional contexts, need additional instruction in both English word skills and language skills. This finding confirmed an earlier study by Mancilla-Martinez and Lesaux (2010), which showed that almost all of the variance in English reading comprehension measures in 6th grade were accounted for by English vocabulary and word-reading skills that were measured at pre-kindergarten.

Quote 4.16

> Our results underscore the increasingly important role that early language-based skills [in English] play for later English reading comprehension outcomes. If we are to narrow the persistent reading achievement gap between English-only and [language minority] learners, future research must focus on investigating *how* best to provide this language-based support beginning in the primary grade years. Such research should examine in particular the ways in which language-based instruction should be adapted across the formal school years.
>
> Mancilla-Martinez and Lesaux (2017, p. 446, italics in original)

4.2.9 A Study of L2 Component Skills That Support Reading Comprehension: A Meta-Analysis

Many researchers have carried out studies on component skills that predict reading comprehension in L1 contexts (e.g., Ahmed et al., 2016; Oakhill & Cain, 2012). In L2 contexts, many component skills have been identified as significant predictors of reading with varying groups of students and in varying contexts. Melby-Verlåg and Verlåg (2012, 2014) reported on skills that influenced early reading development (2011) and component skills that discriminated between L1 reading ability and L2 reading ability (2014). Alderson, Nieminen, and Huhta (2016) reported on finely discriminating diagnostic measures that predict reading abilities and can identify students' instructional needs.

Here we highlight the study of Jeon and Yamashita (2014), who focus on a broad array of component skills that are likely predictors of reading abilities. They combine specific L2 studies into a meta-analysis, based on 59 studies, examining the role of component skills to address three key questions. First, what are the relationships between reading comprehension and 10 component skills? Second, what moderating factors appear to change the ways that component skills predict reading comprehension (e.g., different L1s, ages of learners)? Third, more generally, what are the roles of L1 reading and L2 component skills in predicting L2 reading comprehension? The researchers sorted 10 component skills into four high-evidence skills and six low-evidence skills (based on the number of research studies and independent comparison samples). Major (i.e., high-evidence) component skills included L2 decoding, L2 vocabulary knowledge, L2 grammar knowledge, and L1 reading comprehension. Minor (i.e., low-evidence) component skills included L2 phonological awareness, L2 orthographic knowledge, L2

morphological knowledge, L2 listening comprehension, working memory, and metacognition.

Key findings included the following: first, all four high-evidence skills correlated significantly with L2 reading comprehension. L2 vocabulary knowledge (r = .79) and L2 grammar knowledge (r = .85) correlated very strongly with reading (and with each other); L2 decoding (r = .56) and L1 reading comprehension (r = .50) correlated less strongly. These results fit well with a wide range of prior research. There were two significant moderator variables for the impact of L2 vocabulary on reading: adolescent and adult groups demonstrated a stronger effect of vocabulary on reading, and vocabulary measured by context-embedded items (vocabulary embedded in meaningful contexts) produced a stronger effect on reading than decontextualized vocabulary test items. L1 reading generated one moderating effect; that is, when L1 and L2 were both Indo-European languages, there was a stronger relationship between L1 reading and L2 reading abilities. Of the six low-evidence skills, L2 listening comprehension (r = .77) and L2 morphological knowledge (r = .61) were strong predictors. Metacognition correlated the least strongly (r =. 32).

The researchers' conclusions generally confirm several individual L2 component-skills studies. It is also worth noting that vocabulary and grammar knowledge, both very strong predictors, also strongly overlap. They are, in effect, equally important predictors. Generally, the L2 language-skills components were more strongly related to reading than language-general constructs (metacognition, working memory) or L1 reading ability. L1 reading ability is a factor in L2 reading ability, but not a strong one, and much less strong than several L2 knowledge skills (see also Alderson, Nieminen, & Huhta, 2016).

Quote 4.17

> The average correlation between comprehension outcomes of two languages was much lower despite the shared modality (written). Taken together with the generally higher correlations between L2 language variables and L2 reading comprehension accumulated across many primary studies, [our] results seem to further support the notion that L2 reading comprehension is essentially determined by L2 language ability …. This result … supports the notion that L2 reading comprehension poses a language problem rather than a reading problem.
>
> Jeon and Yamashita (2014, pp. 189, 196)

4.2.10 A Study on the Relative Impact of L2 Component Skills and L1 Reading Ability with Adult L2 Learners

One of the long-standing issues in L2 reading research is the relationships among L2 reading comprehension, L2 language knowledge, and L1 reading ability. Is there an L2 language threshold that must be met for L1 reading to begin to

predict L2 reading ability? Or is there a common underlying interdependence between L1 reading and L2 reading from the outset? The issues are actually very complex and challenging to tease apart. Research studies have been carried out among (a) younger students learning L2 reading within bilingual- education contexts (Geva, Wade-Woolley, & Shany, 1997); (b) younger students learning L2 reading within an L2-only learning system and with weak-to-variable L1 literacy experience (e.g., Mancilla-Martinez & Lesaux, 2017, this chapter); (c) adolescent L2 students who have weak-to-variable literacy experience with their L1 and who are learning to read more advanced L2 text material in middle school and high school after 6–10 years in the L2 school context (van Gelderen et al., 2004); and (d) adolescent and adult learners who have advanced L1 reading skills but weak-to-variable L2 reading skills (and weak-to-variable L2 language skills) (Alderson, Nieminen, & Huhta, 2016; Carrell, 1991). There are also studies with combinations of the learner types just itemized. In addition, the languages (L1 and L2) that are studied vary considerably, likely creating further variability. Rather than throw up our hands, the appearance of additional studies under more careful control should help refine what we can say at present.

In Jeon and Yamashita (2014, this chapter), a meta-analysis explored the roles of component skills, L2 listening (bringing in SVR), and L1 reading abilities as predictors of L2 reading. The strongest predictors across 59 studies were L2 language skills, but there was no controlled analysis to identify the amount of unique variance accounted for by any one variable. Similarly, in contexts where L1 literacy may or may not be instructed but not part of school instruction, L2 language skills (vocabulary, syntax, listening, spelling) is the overwhelming factor influencing later L2 reading (Mancilla-Martinez & Lesaux, 2010, 2017). In English as a foreign language (EFL) contexts, Alderson, Nieminen, and Huhta (2016) used strength of discrimination between stronger and weaker learners to demonstrate that L2 language skills were more important predictors than L1 reading knowledge (although L1 reading knowledge did discriminate weak from strong EFL readers).

In the study highlighted here, Yamashita and Shiotsu (2017) add another set of evidence for the dominance of L2 language knowledge over L1 reading knowledge. The study involved 325 Japanese university-level learners with intermediate EFL reading comprehension skills. The particular strengths of Yamashita and Shiotsu's study include stronger reliability controls on assessment instruments and the use of SEM to explore relations among Japanese L1, English L2 listening comprehension, English L2 written language skills (vocabulary and syntax), and English L2 reading comprehension. These students, on average, were well below English L2 students who might be in most pre-university ESL courses in Australia, Canada, England, New Zealand, or the U.S. Students were assessed on multiple measures of L1 reading and L2 language variables (L2 listening, L2 vocabulary, and L2 syntax). The researchers then transformed the scores on these multiple measures into continuous equatable scores using **Rasch analysis** and then combined scores into **latent composite scores (or latent variables)** of L1 and L2 reading, L2 listening, and L2 language knowledge (vocabulary and syntax).

Yamashita and Shiotsu carried out the major analysis using SEM to generate a best fit model that identified the *unique* contributions of each of the predictor variables on L2 reading comprehension. An advantage of an SEM analysis is that it controls for measurement error across latent variables. The researchers conducted this analysis for the entire group and then for two sub-groups, with higher and lower L2 reading proficiency.

The SEM model provided a good fit with the data from the four latent variables, and it accounted for 94% of the variance in L2 reading. Based on the total shared variance, it is fair to say that the three L2 language variables together explained how these students performed in L2 reading. Using the full sample of students, L2 listening and L2 knowledge (vocabulary and syntax) were strong significant predictors of L2 reading. L1 reading was not a significant independent predictor. Essentially, for the full sample, one could say that L2 reading was explained by the combination of L2 listening, L2 vocabulary, and L2 syntax.

Yamashita and Shiotsu also performed a second SEM without the bottom 20% of the students (i.e., the poorest performing students who may have been challenged by the various tests that they took). This second SEM accounted for 93% of the variance in L2 reading, again very strong results. This time, with a higher-performing average group, all three major variables (L2 listening, L2 language [vocabulary and syntax], and L1 reading) were significant independent predictors of L2 reading. The most important predictor, by a considerable margin, was L2 language knowledge (vocabulary and syntax). L2 listening decreased considerably as an independent predictor; L1 reading become a significant predictor of L2 reading abilities, though still the weakest of the three predictors. Like much prior literature on the language threshold hypothesis with a sub-population of higher performing students, L1 reading begins to contribute to L2 reading skills (see also Pae, 2019).

Quote 4.18

> Overall, the result corroborates the findings of a meta-analysis (Jeon & Yamashita, 2014) by showing that components related to L2 language accounted for L2 reading variance to a considerably larger extent than did L1 reading …. These outcomes lead to the conclusion that L1 reading is evidently a weaker predictor than the other two, at least for this population of EFL learners, but it maintains moderate correlations with L2 reading and its contribution is identifiable at higher proficiency levels.
>
> Yamashita and Shiotsu (2017, p. 56)

4.3 Implications for L2 Instruction

Having offered overview discussions of reading research in Chapters 1 and 2 and then 20+ specific studies in Chapters 3 and 4, here we present 12 implications from both L1 and L2 research that should bear directly on L2 reading instruction

Table 4.3 Implications from Research for L2 Reading Instruction and Assessment

To become skilled readers, students need to develop abilities to

1. Decode graphic forms for efficient word recognition.
2. Access the meanings of a large number of words automatically.
3. Draw meaning from phrase- and clause-level grammatical information.
4. Combine clause-level meanings into larger networks of text comprehension.
5. Recognize discourse structures that build and support comprehension.
6. Use reading strategies for a range of reading tasks.
7. Set goals for reading and adjust them as needed.
8. Use inferences of various types and monitor comprehension for reading goals.
9. Draw on prior knowledge as appropriate.
10. Evaluate, integrate, and synthesize information for critical reading comprehension.
11. Maintain fluent reading processes for an extended period of time.
12. Sustain motivation to persist in reading and use text information for reading goals.

and assessment practices (Table 4.3). The first three implications presented in Table 4.3 support the need for rapid and automatic word recognition and the need for fluent recognition processing of phrase and clause structures that support comprehension. These implications argue for fluency practice, extensive reading, and time spent on the development of a large recognition vocabulary. Implications four and five point out the importance of developing main-idea comprehension using all levels of language knowledge, including discourse structure awareness. Implications six through ten identify strategic processing as a means for improving comprehension of more challenging texts and carrying out academic tasks that require the use of text information. Implications 11 and 12 highlight the importance of reading fluency development, reading practice for extended periods of time, student motivation to persist in and achieve learning goals, and the importance of reading extensively.

Despite the importance of these research implications, there is no guarantee that they can all be converted directly into effective teaching practices. Some implications may be more appropriate for certain groups of students than for others because of students' different proficiency levels, different institutional goals, and different expected student outcomes. Moreover, student outcomes are influenced by many factors beyond specific curricula and classroom instruction (e.g., available resources, teacher abilities, cultural attitudes toward reading). Nonetheless, the implications presented here serve as important starting points for discussions of L2 reading curricula and instructional practices, explored in Part III of this volume.

4.4 Conclusion

The studies presented in Chapter 4 showcase a range of research topics pertinent to L2 settings and illustrate a number of different methods for conducting meaningful research. Multiple studies measured student participants' reaction or processing times; several studies used advanced methodological approaches and statistical methods such as SEM, factor analysis, conservative multiple

regression analyses, longitudinal studies, and meta-analysis techniques. Most of the studies used experimental and comparison groups; the training studies used pre- and post-testing differences to determine study outcomes. In the past 10 years, since the 2nd edition of *Teaching and Researching Reading* was written, several newer research techniques have become more standard in research efforts across both L1 and L2 contexts. The research highlighted in Chapters 3 and 4 has expanded to include new behavioral response measures (eye tracking) as well as measures of additional underlying cognitive variables. This list of research methods only begins to demonstrate the range of options that researchers have open to them.

The range of research options shown in the chapter might lead us to believe that the key studies introduced here are quite different from one another. And indeed, at one level, the studies are quite distinct. At a second level, however, several studies connect in interesting ways to show that multiple components of reading abilities seem to be important in their own right, but also work collaboratively to support L2 reading comprehension abilities. Indeed, some of the studies in this chapter provide additional evidence for assumptions made in other studies in this chapter and Chapter 3. At the same time, it is important to note that all studies have limitations, and thus no one study provides definitive evidence. The most persuasive claims from research emerge when multiple well-designed studies converge toward a generalization and provide a set of evidence to take seriously and possibly act upon.

We should add at this point that a number of *other* L2 reading research areas are also important, but they are not covered in this chapter (because of space constraints). These areas include the uses of reading resources specific to L2 reading (e.g., the use of word lists, translation, glosses, bilingual dictionaries, mental translations) (Laufer & Girsai, 2008; Prichard, 2008; Rott, 2007); the development of more innovative reading assessment options (neurolinguistic processing measures); the impact of online reading resources for academic reading development; the role of reading–writing relationships; the role of socio-cultural influences on reading development; and the influence of teacher training on reading instruction (cf. N. J. Anderson, 2009).

Despite these omissions, the purpose of this chapter and Chapter 3 has not been to provide a tutorial on new research methods. Instead, the goal has been to describe recent and important research findings in a more accessible way (but not ignore key details). These new research findings should impact how we understand L2 reading and how we might want to redesign instructional curricula and day-to-day classroom instruction. They can also lead to new ideas that can be explored by teachers carrying out action research projects in their classrooms (see Chapters 7–9).

We would like to conclude this chapter by returning to a theme introduced in Chapter 3. All research studies really are stories, but stories that use somewhat different language and organization. The studies introduced in Chapter 4 are quite similar to one another in that they all follow a similar storyline. All the researchers started out with good manageable questions; they found participants

(students and oftentimes their teachers); and then they decided on ways to collect information that was controlled in appropriate ways. The information-collection step was followed by an analysis of data to find answers to the question(s) posed; and finally, the researchers inferred fair and reasonable interpretations for their conclusions (based on the evidence) and then commented on the usefulness of the results (and the research). In each case, the story has multiple episodes, with many challenges encountered along the way, with intensive investments of time and effort, and a concluding episode that takes us back to the main guiding theme. Each research study, then, is a story that adds new evidence-based information, which in turn can influence teaching practices.

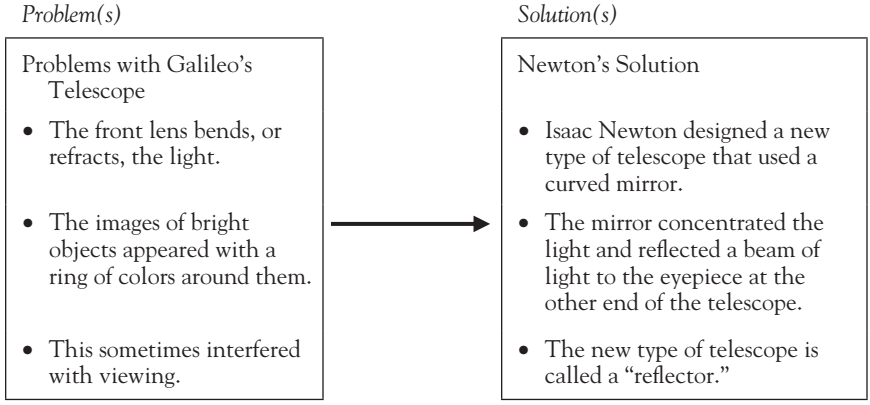
Most of the studies reported in this chapter (and in Chapter 3) were conducted with students of other teachers. But this is not the only way to conduct research. For inquiring teachers who want to improve classroom instruction, conducting a small-scale research study—with their own students and in their own classrooms—by asking manageable questions is a reasonable strategy. By understanding that any research study is much like a story, the steps to be followed can be relatively simple. When following a set of basic steps, any effort to carry out a small-scale research study will evolve, much as a story will unfold through a series of episodes leading to a resolution. This emphasis on teacher-initiated small-scale research is the primary emphasis of Chapters 7–9. But before we move on to teacher-initiated research (i.e., action research), we would first like to consider how the research studies in Chapters 3 and 4 lead to principles for L2 reading curricula design (in Chapter 5) and instructional ideas that can inform our teaching practices (in Chapter 6).

Appendix 4-A: Discourse Structure Graphic Organizer (DSGO), Complete Version

1. Timeline (Time Chronology): Invention of Telescopes (Paragraphs 1 and 2)

Early 1600s	___	• Children put two glass lenses together while playing with them in a Dutch optical shop; the owner of the shop looked through the lenses and noticed their magnifying effect. • Soon after that, the shop owner invented a device called a "looker."
1608	___	• The shop owner failed to sell the "looker." • The Italian scientist Galileo made his own version of the "looker," based on someone's description of it.
1610	___	• Galileo used his version to make observations of the Moon, the planet Jupiter, and the Milky Way.
1611, April	___	• Galileo showed his device to guests at a banquet and one of the guests named the device "telescope."
1700s	___	• More than a century later, Isaac Newton noticed a problem with the refractor telescope that Galileo designed; Newton invented a new type of reflector telescope.

2. Problem–Solution: Problem with Galileo's Telescope and Newton's Solution (Paragraph 2)



3. Description: Today's World's Largest Optical Telescopes (Paragraph 3)

Telescopes	*Location*	*Key Characteristics*
World's largest refracting telescope	Yerkes Observatory, Williams Bay, Wisconsin	Has lenses that are 40 inches across
World's largest reflecting telescope	Caucasus Mountains	Has a 237-inch mirror
World's second largest reflecting telescope	Mount Palomar in California	Has a 200-inch lens
Keck Telescope	On a mountain in Hawaii	Uses the combined light that falls on 36 mirrors, each 5.9 feet in diameter

4. Comparison–Contrast: Radio and Optical Telescopes (Paragraph 4)

	Radio Telescope	*Optical Telescope*
Comparison	• Both allow astronomers to collect data from outer space • Larger is better with both kinds of telescopes	
Contrast	• Collects radio waves • Employs bowl-shaped disks that resemble huge TV satellite dishes • Uses radio receivers to record radio waves from distant objects in space	• Collects light waves • Uses lenses or mirrors • Uses cameras to take photographs of visible objects

Adapted from DSGO developed by Xiangying Jiang, University of West Virginia, for "Telescopes: Tools for Examining the Heavens" in Mikulecky and Jeffries (2007, p. 145).

Appendix 4-B: Discourse Structure Graphic Organizer (DSGO), Instructional Version

1. Timeline (Time Chronology): Invention of Telescopes (Paragraphs 1 and 2)

Early 1600s	___	• Children put two glass lenses together while playing with them in a Dutch optical shop; the owner of the shop looked through the lenses and noticed their magnifying effect. • Soon after that, the shop owner invented a device called a "looker."
1608	___	• The shop owner failed to sell the "looker." • (1) _____
1610	___	• (2) _____
1611, April	___	• Galileo showed his device to guests at a banquet and one of the guests named the device "telescope."
1700s	___	• (3) _____

2. Problem–Solution: Problem with Galileo's Telescope and Newton's Solution (Paragraph 2)

Problem(s)	Solution(s)
Problems with Galileo's Telescope • (4) _____ • (5) _____ • This sometimes interfered with viewing.	Newton's Solution • Isaac Newton designed a new type of telescope that used a curved mirror. • (6) _____ • The new type of telescope is called a "reflector."

3. Description: Today's World's Largest Optical Telescopes (Paragraph 3)

Telescopes	*Location*	*Key Characteristics*
(7) _____	Yerkes Observatory, Williams Bay, Wisconsin	Has lenses that are 40 inches across
World's largest reflecting telescope	Caucasus Mountains	(8) _____
World's second largest reflecting telescope	(9) _____	Has a 200-inch lens
Keck Telescope	On a mountain in Hawaii	Uses the combined light that falls on 36 mirrors, each 5.9 feet in diameter

4. Comparison–Contrast: Radio and Optical Telescopes (Paragraph 4)

	Radio Telescope	**Optical Telescope**
Comparison	• Both allow astronomers to collect data from outer space. • (10) _____	
Contrast	• Collects radio waves • (11) _____ _____ _____	• Collects light waves • Uses lenses or mirror
	• Uses radio receivers to record radio waves from distant objects in space	• (12) _____ _____

Adapted from DSGO developed by Xiangying Jiang, University of West Virginia, for "Telescopes: Tools for Examining the Heavens" in Mikulecky and Jeffries (2007, p. 145).

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The following additional citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Discourse organization and text comprehension*, see Duke and Watanabe (2013), Jiang and Grabe (2007, 2009).
- *Main idea comprehension and instructional routines*, see Grabe and Stoller (2018), Hedgcock and Ferris (2018), Nation (2009), Vaughn et al. (2017).
- *Statistical reference resources*, see Loewen and Plonsky (2016).
- *Topics unique to L2 reading settings*, see Hulstijn (2015a), Laufer and Girsai (2008), Pritchard (2008), Rott (2007).
- *Vocabulary Level and Size Tests*, see Schmitt (2010) and Nation website https://www.victoria.ac.nz/lals/about/staff/paul-nation#vocab-tests
- *Vocabulary word lists*, see Kress and Fry (2016) and Nation website https://www.victoria.ac.nz/lals/about/staff/paul-nation#vocab-lists
- *Word-level issues in reading development*, see Koda (2005), Nation (2009), Schmitt (2008, 2010).

Note

1 See Chapter 10 for a list of the key L2 research studies highlighted in the 1st and 2nd editions of *Teaching and Researching Reading*.

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Part III

L2 Reading Curricula and Instruction

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5 Principles for L2 Reading-Curriculum Design

This chapter introduces the essentials of reading-curriculum design, building on what we know about the skill of reading (introduced in Chapters 1 and 2), what we have learned from L1 and L2 reading research (introduced in Chapters 3 and 4), and what we know about learning more generally. Our evidence-based principles of reading-curriculum design have been organized into three sets, with a total of 14 principles that can guide those who are directly involved in curriculum design and renewal efforts in addition to classroom teachers, materials writers, assessment teams, and language-program administrators. Of particular interest are the following sets of principles:

- Core reading-curriculum principles.
- Reading-skills development principles.
- Instructional-design principles.

The ability to read well may be the most important skill needed by L2 students who have academic aspirations. In academic contexts, reading provides a major source of input for further learning of both language and course content. Furthermore, reading typically generates increased interest and motivates students to explore topics further through additional reading. Yet skilled reading is not a simple endeavor; it requires the mastery of reading component skills, the integration of comprehension abilities, the development of a large vocabulary, and a reasonably good command of grammar resources. The good news is that explicit instruction in reading-skills development makes a difference (Grabe, 2009; Grabe & Stoller, 2018; Hedgcock & Ferris, 2018).

In this chapter, we introduce three sets of principles governing reading-curriculum design. The 14 principles can guide language professionals involved in reading curriculum design and renewal (Nation & Macalister, 2010). The principles are adaptable to the range of courses in which L2 reading is addressed, including discrete-skill reading courses; integrated-skills courses in which reading is integrated with one or more language skills (e.g., a reading–writing course); content-based courses that make a dual commitment to language- and content-learning aims; English for academic purposes (EAP) and English for specific

purposes (ESP) courses; and extensive reading course components or programs. Furthermore, the principles are applicable in textbook-driven settings (i.e., where curricula are defined by the textbook adopted for use), with some degree of textbook adaptation and supplementation. The principles are pertinent *across* the curriculum (from beginning to advanced levels), as L2 students become more proficient, as the texts that they are assigned to read become longer and more complex, as new print and online genres are incorporated into instruction, and as students make the transition from learning-to-read to reading-to-learn.

Quote 5.1

> The application of principles [of curriculum design] involves first of all deciding on the most important principles to apply and monitoring their application through the whole design process. The result of applying principles is a course where learning is given the greatest support.
>
> Nation and Macalister (2010, p. 1)

The principles, when translated into practice (as shown in Chapter 6), aim to help students (a) improve their reading abilities and (b) become self-motivated, independent, and strategic readers who can handle reading demands in future reading contexts. Most important, courses structured around these principles will prepare students for academic contexts in which they are likely to encounter heavy reading loads, challenging texts, and the need to make effective use of textual information for multiple purposes (e.g., writing papers, giving oral presentations, completing projects).

5.1 Core Reading-Curriculum Principles

The four core reading-curriculum principles focus on the importance of amount, frequency, purposefulness, practice, discussion, and motivation. These factors are central to effective reading curricula but also transcend reading because they are fundamental to learning more broadly.

5.1.1 Principle 1—Asking Students to Read a Lot, Read Often, and Read for Well-Defined Purposes, Rather Than Read for No Purpose at All, Should Guide Instruction across the Reading Curriculum

To become a good reader requires reading a lot and reading often. There are simply no shortcuts (Grabe, 2009). Unfortunately, students, even in discrete-skill reading classes, typically read very little. In fact, reading classes are often more like conversation classes because rather than focusing on reading-skills development, class activities center around (a) a quick *oral* review of post-reading comprehension questions (often without any reference back to the reading passage), (b) vocabulary-building activities (that are not always connected to the passage

that has been read), and (c) "personalization" tasks that connect the topic of the assigned reading to students' personal lives, without holding students accountable for what they have read. In sum, there is oftentimes more speaking (and listening) practice in reading classes than reading itself.

Equally important is purposeful reading (Britt, Rouet, & Durik, 2018). In many L2 classrooms, students are simply assigned to "read" a passage and answer post-reading comprehension questions "for the next class meeting." Such assignments are typically made without establishing any meaningful purpose for reading (except to comply with a teacher request). Even well-respected textbooks often direct students to simply "read." Skilled readers, however, always read for a purpose. Well-defined purposes for reading influence (a) the ways skilled readers approach texts (e.g., faster, slower, more carefully, more casually, with pencil or pen in hand) and (b) readers' expectations of the reading experience. To illustrate, skilled readers might read quickly to search for information, understand the gist of a passage, or decide if a text is worth reading more carefully. In academic contexts, students might also read to evaluate, critique, or use information for other purposes (e.g., to write a summary, prepare for a debate). Readers may also turn to print or digital sources to simply read for general comprehension and enjoyment.

Skilled readers often re-read important texts (for a second or third time), also for well-defined purposes. In fact, purposeful re-reading is a common strategy used by skilled readers to solve comprehension difficulties, identify important details, determine relationships among ideas (in one or more texts), find evidence of an author's viewpoint, and, in school settings, review for quizzes or other assignments. Rarely, however, are L2 students directed to re-read for well-defined purposes.

Reading curricula should be structured to encourage L2 students to read and re-read for authentic purposes, in and out of class, as one way to model and reinforce good reading habits. Specified purposes for reading vary; they depend on the nature of the text, students' familiarity with the topic, connections with other texts that students have read or will read, and the ways students will use the information encountered (e.g., to write a summary, synthesize two or more texts, compare viewpoints). Asking students to simply read, for no purpose at all, is counterproductive if we want students to develop the skills of strong readers.

While promoting a lot of purposeful reading, students should be assigned a range of materials, including (a) materials that are within their grasp for reading enjoyment, as seen in extensive reading and pleasure reading programs (Beglar & Hunt, 2014; Beglar, Hunt, & Kite, 2012; Suk, 2017; Wilhelm & Smith, 2016) and (b) materials that are more challenging (but not frustrating) so that students can practice using reading strategies to achieve their comprehension goals and, at the same time, feel a sense of accomplishment.

5.1.2 *Principle 2—Incorporating Deliberate Practice into Reading Curricula Supports Reading-Skills Development and Accelerated Learning*

The role of practice in developing language skills is universally accepted as a requirement for mastering cognitively demanding skills (DeKeyser, 2015).

However, reading-skills development, because it is driven in large part by incidental and implicit learning, requires more than sets of overt practice exercises. Research over the past 30 years in the psychology field of expertise and expert performance (Ericsson, 2009) has argued that skill expertise (and skilled reading is a type of cognitive expertise) requires more than sets of practice activities in a reading coursebook. What reading requires is "**deliberate practice**" (as well as thousands of hours of reading).

Deliberate practice is depicted by Ericsson (2009) and Ericsson and Pool (2016), in their discussions of the development of expertise, as purposeful, goal directed, and communicative. Deliberate practice, in the context of reading-skills development, entails more than just reading a lot and often (Munger & Murray, 2014). Some of the characteristics of deliberate practice are as follows:

- Deliberate practice involves well-defined goals for improving select aspects of the target performance; goals can be broken down into sub-goals and more specific sub-routines that develop the larger skill.
- Deliberate practice entails staged and sequenced tasks.
- Deliberate practice necessitates learners' full attention and concentration.
- Deliberate practice requires feedback and modification of effort in direct response to feedback.
- Deliberate practice involves building or modifying previously acquired skills and working to improve them.
- Deliberate practice requires learner self-monitoring, reflection on achievements, and motivation.
- As part of deliberate practice, the learner understands (a) the purposes of practice goals and tasks and (b) the need for practice to achieve desired outcomes.

While this principle is a new one for many educational specialists and it is designed for a broader conceptualization of skills learning than reading or language, we believe that it is on the right track for helping students achieve advanced reading skills. How this concept is translated into the teaching and learning of reading skills should be a topic for future research (and action research). However, reading curricula that integrate elements of deliberate practice, with the teacher taking the "reading coach" role, are likely to witness accelerated learning and improved reading abilities among students.

Quote 5.2

> Advanced readers have engaged in hundreds, if not thousands, of hours of reading. What they attend to, and do, will be different, at least in part, from what they attended to and did when they were less experienced readers. In this respect, highly skilled readers have developed and

> adapted their expertise over countless text reading occasions, and encouraging nonproficient readers to mimic what expert readers do, outside of the deliberate practice framework, is risky.
>
> Munger and Murray (2014, p. 109)

5.1.3 Principle 3—Promoting Discussion among Students about Text Comprehension Is Essential for the Development of Strategic Readers

Discussion about texts is a common practice in many L2 reading classes. These discussions often are used to develop shared background knowledge for ideas prior to reading about them in a text. Another common use of discussion is to wrap up an instructional unit as a way to extend ideas from a text to more personal connections and interpretations. However, the role of discussion in this principle emphasizes discussion somewhat differently. In line with the concept of deliberate practice (Principle 2), the focus of discussion in reading courses should be on how to achieve text comprehension in addition to what the text is about.

The concept of discussion is essential for reading-skills improvement and the development of more strategic readers (Beck & Sandora, 2016b; Garas-York & Almasi, 2017; Murphy, Wilkenson, Soter, & Hennessey, 2009). In-class discussions—as a full class, in student pairs, or in small student groups—can serve as (a) catalysts for checks on main-idea comprehension and (b) opportunities to build awareness of what strategies other students are using to achieve better comprehension. These goals need to be guided by the teacher on a consistent basis, as she or he introduces and reinforces sets of specific reading strategies that in combination will help students become more strategic readers. At the same time, discussion should extend learning more broadly, reinforce main idea comprehension, build discourse structure awareness, and consolidate vocabulary learning more specifically.

Teachers should regularly allocate class time for meaningful discussions that go beyond a simple review of answers to post-reading comprehension questions. Students should be encouraged to discuss *how* they achieved text comprehension, *what strategies* they used and *what purposes* they served, *why* certain text features aided text comprehension (e.g., bolded section headings, end-of-text summary), and *which* vocabulary was key to text comprehension. Through in-class discussions, teachers can nurture a collaborative classroom environment (Guthre & Klauda, 2016), discussed more fully in Principle 4. The discussions that we are advocating here should be part of the normal reading-classroom routine rather than something extra if and only if time permits.

Quote 5.3

> Collaborative activity in the classroom is often viewed as a driver of literacy engagement.
>
> Guthrie and Klauda (2016, p. 50)

5.1.4 Principle 4—Building Student Motivation to Read Is Essential

Quote 5.4

> [Teachers] should consider ways to motivate students and, perhaps more importantly, help students take responsibility for their own motivation.
>
> N. J. Anderson (2015, p. 105)

Student motivation plays a vital role in learning, just as it does with reading-skills development. Research has consistently shown that motivation and positive attitudes toward reading lead to increased reading engagement, as measured by time on task, effort, concentration, and volume of reading (N. J. Anderson, 2015; Guthrie & Klauda, 2016; Guthrie & Taboada Barber, 2019). Engaged readers—who read greater amounts—develop automaticity of many of the cognitive processes associated with skilled reading including decoding skills, use of background knowledge for comprehension, rapid inferencing, reading fluency, and vocabulary growth (Guthrie, Klauda, & Ho, 2013). Students who self-identify as readers and who enjoy reading are more likely to develop into skilled, autonomous readers (McCardle, Chhabra, & Kapinus, 2008). Students' sense of self-efficacy, willingness to read, and openness to reading instruction and related activities contribute to their becoming autonomous readers.

However, building student motivation can be a real challenge for teachers. Disinterested students will not read nearly enough texts, books, or digital media in English to gain the types of deliberate practice and sheer amount of time spent reading to become skilled readers. Teachers are often not sure about what they should, or can, do to motivate students to become better readers, more interested readers, voracious readers. The good news is that teachers can positively influence students' motivation to read in classrooms with the characteristics noted in Table 5.1.

Table 5.1 Classroom Characteristics That Nurture Student Motivation to Read

- Teachers create collaborative and safe classroom learning environments in which students feel comfortable taking more active roles in learning and working within supportive peer groups.
- Teachers give students some choices of texts and tasks.
- Teachers incorporate activities that make texts interesting and relevant.
- Teachers ensure that students experience reading success.
- Teachers emphasize the importance of reading.
- Teachers make sure that students understand the purpose(s) for the reading-skills development activities incorporated into instruction.
- Teachers guide students in discovering what they have actually learned *from* reading, best accomplished through some form of **content-based instruction** (see Concept 5.1.)

Concept 5.1: Content-Based Instruction

Content-based instruction (CBI) is an umbrella term referring to instructional approaches that make a dual, though not necessarily equal, commitment to language- and content-learning objectives. Unlike other approaches to language instruction that define primary content in terms of grammatical structures, communicative language functions, or language skills, in CBI, content refers to the use of non-language subject matter aligned with traditional school subjects, themes of interest to students, or vocational or occupational areas. What most content-based approaches share is the assumption that content and language create a symbiotic relationship whereby the learning of content contributes to the learning of language and a mastery of language gives learners easier access to content (see Snow & Brinton, 2017).

5.2 Reading-Skills Development Principles

Successful reading, as explained in Chapters 1–4, requires the coordination of language knowledge (e.g., vocabulary, syntax, discourse awareness) and numerous processes, sub-skills, strategies, and ways of reading. Effective reading curricula should explicitly address these varied aspects of reading in deliberate, consistent, and scaffolded ways. Translated into practice, this means, at a minimum, explicitly (a) helping students expand their vocabulary and develop independent vocabulary-learning strategies, (b) building students' discourse structure awareness to support comprehension, (c) providing students with opportunities for reading-fluency improvement, and (d) training students to become strategic readers while they are reading for comprehension. Principles 5–8 explore these issues further.

5.2.1 Principle 5—Making a Commitment to Vocabulary Teaching and Learning Is Foundational to Students' Reading Success

It should come as no surprise that vocabulary knowledge is closely related to reading abilities and reading comprehension (Ash & Baumann, 2017; L. Robb, 2014). In fact, vocabulary and reading have a symbiotic relationship. That is, vocabulary growth leads to improved reading comprehension, and, at the same time, amount of reading leads to vocabulary growth (e.g., Ganske, 2019). Students' vocabulary growth benefits from a commitment to reading-skills development (from beginning to advanced proficiency levels) in addition to explicit attention to vocabulary building, vocabulary recycling, and vocabulary-learning strategies.

As students develop more advanced language abilities, they read more complex informational texts and new textual genres with the expectation that their attention will shift from learning to read to reading to learn. When students are exposed to new content areas, they inevitably encounter new vocabulary that is important for comprehension (Gardner, 2013; Schmitt, Jiang, & Grabe, 2011). One of the challenges that teachers face is that they cannot possibly teach all the words that students need to know (Zimmerman, 2009). Thus, introducing students to strategies for independent vocabulary learning is imperative. At the same time, teachers can contribute to students' vocabulary growth by judiciously selecting the lexical items that they teach and recycle.

Quote 5.5

> **Here is a reading riddle**: what knowledge always precedes high-level text comprehension and yet seldom is given sufficient instructional time? **The answer**: word knowledge.
>
> L. Robb (2014, back cover of book; bolding in original)

The importance (and challenge) of vocabulary is clarified when we consider that if students are to understand a range of texts on their own with *adequate* comprehension, they need to recognize at least 98% of the words they encounter on the page (Laufer & Ravenhorst-Kalovski, 2010; Nation, 2006; Schmitt, Jiang, & Grabe, 2011). The number of words needed for 95% coverage of most texts, as an estimate, lies somewhere between 12,000 and 15,000 words; 98–99% of word coverage of most texts probably requires a recognition vocabulary of about 36,000–40,000 words (Graves, 2016; Schmitt, 2008, 2010; Stahl & Nagy, 2006). The 95% goal is useful when students are reading texts with instructional support. A realistic goal for more advanced L2 reading is an L2 recognition vocabulary greater than about 33,000 words (or roughly 8,000 word families). Of course, the argument that students need to know the most frequent words as well as possible still retains its force as a key incentive for developing effective vocabulary instruction (Gardner, 2013; Grabe, 2009; Webb & Nation, 2017).

Concept 5.2: Determining Vocabulary Frequencies

The ability to define words as a focus for study and for teaching is a major challenge. Researchers discuss word frequencies in terms of words (exact spelling and form), lemmas (word forms and their inflections), and word families (all words that have the same identifiable single root-word form). Each of these approaches to word frequencies has its own problems. None considers different meanings of word forms or the concept of multi-word units that have unique meanings. Most automated programs

for determining word frequencies count word families (as the easiest, fairly useful way to automate frequency counts). But word families are only very approximate measures, so caution should be used in translating word-family frequencies into instructional planning. (For differing views in this debate, see Gardner, 2013; Graves, 2016; Webb & Nation, 2017.)

5.2.2 Principle 6—Raising Students' Discourse Structure Awareness and Teaching Them How to Use That Knowledge to Improve Their Reading Comprehension Should Be Regularly Addressed in Reading Lessons

Good readers recognize the organization of textual information and the signals that provide cues to this organization. They can also identify and make use of (a) lexical forms that reveal specific organizational patterns such as cause–effect, comparison–contrast, problem–solution; (b) words that signal main ideas, details, topic shifts, and transitions (see Appendix 5-A); and (c) headings, subheadings, and paragraphing. Furthermore, good readers recognize how topics are maintained through pronouns and other anaphoric cues. Research has provided evidence for the instructional effectiveness of teaching discourse signals explicitly, using **graphic organizers** to display organizational patterns (Lapp, DeVere Wolsey, Wood, & Johnson, 2015), and raising students' discourse structure awareness through reading-strategy training (Duke & Martin, 2019; Mokhtari & Sheorey, 2008). Raising students' discourse structure awareness and teaching them how to apply this awareness to achieve text comprehension should be key elements of reading curriculum planning (Grabe, 2009; Jiang, 2012).

Concept 5.3: Text Structure Awareness

Good readers are aware of and make use of textual and language features. Good readers are attuned to the ways information is organized and the signals that provide cues to this organization; they use this information (e.g., words that signal rhetorical patterns, transition phrases, headings, paragraphing, topic shifts) to achieve reading comprehension. In fact, it is well established that reading comprehension depends on a reader's awareness of text structure. Yet few reading curricula focus on text structure awareness as a consistent component of instruction.

5.2.3 Principle 7—Addressing Reading Fluency, at Word and Passage Levels, Is Essential for Efficient Reading Comprehension Abilities

Fluency in reading is central to efficient reading abilities. Reading fluency is, in fact, both a contributor to and a product of comprehension (Kuhn, Rasinki, & Young, 2019). Fluent reading involves automaticity (recognizing words and phrases without effort), rate (reading quickly), accuracy (reading accurately), prosody (reading with appropriate word groupings), and reading with comprehension. A commitment to reading-fluency development is needed at all levels of language instruction (through to advanced levels) and with learners of all ages; such a commitment is accomplished by means of reading fluency activities and plentiful reading opportunities (Principle 1). Making such a commitment recognizes the incremental process that, over time, moves students toward the reading fluency that they need for skilled reading, especially in academic contexts where students are likely to encounter large amounts of reading.

Unlike some common beliefs, fluency is not achieved when L2 students reach a certain number of words per minute (e.g., 200 words per minute). In fact, skilled readers read at different rates, depending on their purposes for reading. What the various reading rates noted in Table 5.2 suggest is that reading curricula need to regularly engage students in reading for different purposes, accompanied by a variety of fluency-building activities (N. J. Anderson, 2014).

Quote 5.6

> One thing we know about the development of fluency is that it must be a continual focus in the classroom over an extended period of time to sufficiently develop fluency in readers. A cohesive program will have fluency-related goals for each class so that there is a focus on its development within a class and also across classes in the program. In this way, as students progress through a program, they will continue to explicitly develop their reading fluency skills.
>
> N. J. Anderson (2014, p. 185)

Table 5.2 Fluent L1 Reader Rates When Reading for Different Purposes (from Carver, 1992)

Reading Rate (words per minute, wpm)	*Purpose for Reading*
600 wpm	Scanning
450 wpm	Skimming
300 wpm	Reading with understanding
200 wpm	Reading to learn
138 wpm	Reading to memorize

5.2.4 Principle 8—Training Strategic Readers Is More Effective Than Teaching Reading Strategies One at a Time

Skilled readers, by definition, are strategic. Strategic readers know *which* strategies to use—in addition to *when*, *how*, and *why* to use them—to overcome comprehension difficulties and achieve comprehension goals. Reading curricula that are committed to training strategic readers, rather than simply teaching strategies one at a time, are best positioned to help students develop skilled reading abilities (Almasi & Hart, 2019; Boardman & Jensen Lasser, 2016; Pearson & Cervetti, 2017; see also R. Brown, 2017).

Consider the differences between teaching individual reading strategies and training strategic readers. The former is perpetuated by textbooks that introduce one reading strategy at a time, often within a decontextualized lesson segment. With this common approach, students might be introduced to previewing (in Chapter 1), predicting and checking predictions (in Chapter 2), connecting text to background knowledge (in Chapter 3), creating mental images (in Chapter 4), inferencing (in Chapter 5), and so forth. With this (sadly) conventional instructional approach, students are rarely asked to use such strategies while actually reading for comprehension. They also are not guided in using multiple strategies in combination, which is what skilled readers do.

When training strategic readers, teachers

- Provide explicit introductions to reading strategies used to achieve text comprehension.
- Incorporate multiple opportunities for deliberate practice in strategy use *while* students are actually reading for comprehension.
- Guide class discussions about strategy use (focusing on which strategies are used, when, how, why).
- Recycle strategies (in new combinations) with new passages.
- Give students opportunities to read (or re-read) more challenging texts, followed by pair and group discussions about strategies used for improving text comprehension.

A curricular commitment to such strategic-reader training practices is likely to result in more skilled and confident readers. When strategic reading is regularly addressed across the curriculum, as the texts that students read become longer and more complex, students, over time, develop the habits of strategic (and independent) readers. Appendix 5-B provides an inventory of strategies commonly used by skilled readers.

Quote 5.7

> The Achilles heel for strategy instruction … is finding a way to make it a part of 'daily life' in classrooms. It is one thing to implement strategy instruction for a certain number

> of minutes each day for the 10 weeks of a pedagogical experiment, but is quite another to sustain a strategy emphasis over an entire school year…. In short, it is easy to teach strategies in short spurts, but it is hard to curricularize them.
>
> Pearson and Cervetti (2017, p. 35)

5.3 Instructional-Design Principles

The six instructional-design principles introduced here emphasize the importance of (a) teaching rather than testing main idea comprehension; (b) structuring lessons around a pre-, during-, and post-reading framework; (c) selecting and adapting suitable texts for instruction; (d) addressing digital literacy; (e) connecting reading and writing; and (f) incorporating assessments *for* learning into reading instruction. (See Richards, 2017, for more on L2 curricula and the organization of language-teaching programs.)

Quote 5.8

> A curriculum can be seen to reflect the best interpretation of the current state of knowledge concerning what a second language is and how it can be taught, as well as an understanding of how best to organize a language-teaching program.
>
> Richards (2017, p. 6)

5.3.1 Principle 9—Teaching (Rather Than Testing) for Main-Idea Comprehension Should Be a Standard Component of Classroom Instruction

Teachers, without realizing it, typically devote more time to "testing" reading comprehension than teaching for comprehension (N. J. Anderson, 2014). When structuring a reading lesson mainly (or solely) around a review of post-reading comprehension questions, teachers are essentially testing comprehension rather than taking advantage of opportunities to *teach* students *how* to comprehend. Teaching *for* reading comprehension entails, at a minimum, teaching students and engaging students in discussions of

- When and why to preview, predict, and check predictions.
- How to identify main ideas.
- How to make use of background knowledge.
- How, why, and when to use context clues to understand unfamiliar words, and, when context clues are not present, how to use other textual signals to comprehend new lexical items.

- How to draw appropriate inferences to enhance text understanding.
- How to use visual imagery to assist with comprehension.
- When and for what purposes to re-read.

Explicit attention to these essential elements of skilled reading, when combined with class discussions about the steps taken to make sense of the texts that students are reading, is certainly more important in the long term than simply reviewing post-reading comprehension questions and moving on (e.g., to the next textbook chapter). The classroom discussions that we are advocating here (and in Principle 3) provide valuable opportunities for students to talk—to one another and the whole class—about *how* to understand the texts that they read.

Concept 5.4: Reading Comprehension versus Main-Idea Comprehension

The terms "reading comprehension" and "main-idea comprehension" are sometimes used synonymously, and we do this as well in this volume. Technically, however, reading comprehension is a broader term. Reading comprehension can include understanding and retrieval of details, facts, and examples. Reading assessments often measure reading comprehension by including questions about details and fairly minor facts. In addition, reading comprehension may include expectations about connecting many facts and ideas, some of which are main ideas but some of which may be relatively local or minor. Overall, however, the most important aspect of reading comprehension is main-idea comprehension.

5.3.2 Principle 10—Structuring Reading Lessons around a Pre-Reading, During-Reading, and Post-Reading Framework Should Guide Class Planning

Reading lessons, interpreted broadly, should be structured around pre-, during-, and post-reading stages that permit students to be exposed to and practice the range of reading sub-skills and strategies used by skilled readers at different points in the reading process (Hedgcock & Ferris, 2018). The amount of class time devoted to each stage of the reading lesson is variable, depending on instructional goals, students' reading proficiencies, length of class meetings, and the texts assigned. A single lesson might include all three reading stages, though the text would have to be quite short or the class session quite long to do so. Probably more typical would be a span of numerous class sessions during which the teacher could incorporate pre-, during-, and post-reading activities.

Each stage of the reading lesson provides opportunities to introduce and have students practice stage- and text-appropriate reading strategies. During each stage, the teacher has the opportunity to guide, model, and set students up for success. Of the three stages, it is the during-reading stage that is most often neglected in published textbook materials. Adapting textbook materials to incorporate during-reading strategies (and authentic purposes for reading) can truly enhance a reading curriculum.

5.3.3 Principle 11—Selecting and Adapting Texts Should Be Driven by Students' Proficiency Levels, Current and Future Reading Needs, and Interests

What teachers ask students to read, and how teachers use those reading materials, can greatly influence students' progress in reading-skills development (in addition to students' motivation for reading). In ideal circumstances, text selection is guided by identifying print and digital reading materials that (a) complement students' L2 proficiency levels, ages, maturity levels, and interests and (b) can be read with scaffolded instruction or independently. Yet in most settings, textbooks are selected by others for teacher use. In these cases, teachers can build upon those textbooks to promote reading improvement. For example, if the mandated textbook does not include any fluency-development activities, teachers can design them around textbook reading passages and add them to their lessons. If the textbook does not address strategic-reader training explicitly, teachers can adjust their lessons to do so. If the textbook does not include read-to-write tasks that hold students accountable for reading-passage content (Principle 13), teachers can devise such tasks. Similarly, if a textbook chapter (or unit) includes only one reading passage on a particular topic, teachers can locate related readings (print and digital) to build students' content knowledge and permit more cognitively challenging tasks, such as syntheses. With supplementary readings, topic-related vocabulary is recycled, and content learning is likely to be more successful, thereby simulating academic contexts where students commonly read related texts to build their content knowledge. Even teachers with little extra time to modify their reading lessons can augment their textbooks in small but principled ways to more fully promote reading-skills development (Stoller, Anderson, Grabe, & Komiyama, 2013).

Reading curricula that include both easy and sufficiently challenging reading passages permit teachers to address students' varied reading needs. Easy reading materials (e.g., level-appropriate **graded readers**) can be read for enjoyment, without frustration, and with opportunities for reading success. In extensive reading programs, students are encouraged to read large quantities of material (often self-selected) that are within their grasp (Beglar & Hunt 2014; Mikulecky, 2011). Appropriately challenging (but not frustrating) texts, on the other hand, lend themselves to scaffolded instruction, during which students actively and purposefully use (and practice) strategies that skilled readers would use to understand the text (e.g., previewing, making predictions, reading to confirm or modify predictions, inferencing, re-reading, taking notes, summarizing).

Reading materials that are too challenging (i.e., at the frustration level because of, for example, too many unknown words, grammatical complexity, or poorly signaled organization) are instructionally ineffective. Such materials quickly de-motivate students, and de-motivated students do not enjoy reading, do not read much, and therefore do not (and cannot) improve their reading abilities.

In addition to integrating easy and appropriately challenging texts into instruction, students benefit from reading texts of different types, including print and digital texts, narrative and expository texts, prose and non-prose, informational texts, texts with different types of discourse organization (e.g., description, comparison–contrast, problem–solution, chronology), and **non-linear texts** (e.g., charts, diagrams, figures, graphs, maps, and tables). For students with academic aspirations, academic digital literacy skills, taught with appropriate digital texts, should also be addressed (see Principle 12).

5.3.4 Principle 12—Addressing Students' Digital-Literacy Skills Responds to Students' Present-Day and Future Reading Needs

Now that we are well into the 21st century, it is time to make a commitment to digital-literacy training in our L2 reading curricula. In today's world, most language students seem to spend much more time on their electronic devices than with print texts (Kervin, Mantei, & Leu, 2018). Yet the skills (and comfort levels) that students have developed using their digital devices for (mainly) social purposes do not transfer into the reading comprehension skills and strategies that they need for more academic digital texts and tasks (Coiro, 2015; Dobler, 2015; Zawilinski, Forzani, Timbrell, & Leu, 2019). What this suggests is that digital texts and tasks should become an increasingly important part of reading comprehension instruction (Cobb, 2017; Dobler & Eagleton, 2015; Geva & Ramírez, 2015). To prepare students for the digital-literacy demands inherent in reading-to-learn contexts, at school, and in the workplace, language teachers should address the digital tasks that have implications for academic success (Table 5.3). (See Model Action Research Project 9.1.6, focused on students' digital-literacy needs.)

Table 5.3 Digital Reading Tasks That Have Implications for Academic Success (drawn from Dobler & Eagleton, 2015)

- Navigating the convoluted pathways inherent in online information searches.
- Locating academically relevant online information.
- Reading online sources critically.
- Determining the importance of information.
- Judging the accuracy, reliability, and bias of online sources.
- Determining authorship.
- Making connections within and across online texts.
- Using online information responsibly for written assignments (see also Principle 13).

Quote 5.9

> All the skills needed for successful reading of traditional written texts are also important for reading digital text. … Nevertheless, some characteristics of digital reading … are different from reading print text. Hyperlinked online reading passages are multimodal, interactive, and non-linear. Navigating them demands more flexibility, attention, focus, and quick judgment than reading traditional text in order to distinguish trustworthy and valuable content from junk.
>
> Geva and Ramírez (2015, p. 142)

5.3.5 Principle 13—Connecting Reading to Writing Prepares Students for the Realities of Most Academic Contexts

In academic settings, tasks that require the integration of reading and writing are commonplace. In fact, the ability to integrate reading and writing is critical for academic success (Grabe & Zhang, 2013; Hedgcock & Ferris, 2018; McCardle, Long, & Miller, 2014; Miller, McCardle, & Long, 2014). Using textual resources to complete academic writing tasks is challenging for students and requires a lot of practice. When making a curricular commitment to reading–writing integration, students can be guided in numerous tasks, including summarizing, synthesizing information from multiple sources, and responding critically to textual input. Students can also practice taking notes while reading and using notes for authentic purposes (e.g., writing a paper).

Grabe and Zhang (2013) recommend initiating reading–writing integration early in language-program curricula and providing opportunities for a lot of iterative practice. At the point when students are reading informational texts, reading curricula can connect reading and writing by focusing explicit attention on reading comprehension with the texts that students will use in read-to-write tasks. Reading–writing integration creates natural opportunities for reinforcing the importance of being responsible for text information (rather than relying on personal opinions) and understanding the expectations of different read-to-write tasks.

Quote 5.10

> Reading and writing are connected—both are language-related abilities, and together they form what we refer to as literacy. Indeed, it seems intuitively obvious that reading and writing are related, complementary, and might even be considered two sides of the same coin.
>
> McCardle, Long, and Miller (2014, p. 155)

5.3.6 *Principle 14—Assessing Students' Reading Progress Is an Essential Part of Teaching, Curriculum Development, and Student Learning*

In our discussion of Principle 9, we stated that the teaching, rather than the testing, of main-idea comprehension should be central to what we do in our reading classes. Nonetheless, in reading curricula, there is an important place for assessment, which, for practical purposes, can be divided into two basic types: assessments *of* learning (i.e., proficiency[1] and achievement[2]) and assessments *for* learning, the latter used for guiding and supporting student learning (Wiliam, 2011; Wiliam & Leahy, 2015). **Assessments *for* learning**—also referred to as **learning-oriented assessment** (Carless, 2007; Turner & Purpura, 2016)—measure students' day-to-day (or weekly) improvements; results are used to provide **forward-looking feedback** (Carless, 2007). Both assessments *of* and *for* learning are important indicators of the effectiveness of a reading curriculum.

The major difference between the concepts of assessment *of* and *for* learning centers on how indicators of student performance are used. In assessments *of* learning, teachers gather evidence, from formal and informal measures of student performance, to decide how well students seem to be learning and how well the curriculum is working. The concept of assessment *for* learning, on the other hand, is one that all teachers should embrace as part of their ongoing efforts to improve students' learning. Assessment *for* learning focuses on students' performance "at the moment," most commonly through informal measures of progress. This form of assessment should result in forward-looking teacher feedback that (a) raises students' awareness of their learning progress, (b) leads to classroom discussions and student self-reflection to improve learning outcomes, (c) facilitates teacher–student and student–student interactions centered on ways to improve reading performance, and (d) results in active student engagement with feedback to improve their reading abilities. This way of thinking about assessment is different from common conceptions of assessment, but it is fundamental to student learning and, in this case, reading-skills development.

Quote 5.11

> The teacher's job is … to engineer effective learning environments for students. The key features of effective learning environments are that they create student engagement and allow teachers, learners, and their peers to ensure that learning is proceeding in the intended direction. The only way we can do this is through assessment. That is why assessment is, indeed, the bridge between teaching and learning.
>
> Wiliam (2011, p. 50)

5.4 Conclusion

In this chapter, we have introduced 14 principles that can inform the development or refinement of L2 reading curricula. Although discussed individually and

listed separately in Appendix 5-C, in actuality, the 14 principles support and reinforce one another while helping students become more motivated, skilled, and strategic readers. For example, what we noticed, while writing this chapter, is how often discussion (Principle 3) was suggested elsewhere. Discussion—in student pairs, student groups, and as a whole class—is fundamental to so many aspects of reading instruction, as will be seen in Chapter 6.

Underlying our 14 principles are five assumptions that are worth pointing out. First is the recognition that students engage most enthusiastically in reading instruction when text materials are interesting, relevant, varied, abundant, visually attractive, and accessible. Second, students respond well to reading instruction when given some choices in reading texts and tasks; some degree of student choice encourages student engagement, motivation, and autonomy. Third, explicit instruction and reading-skills development tasks should build upon the main texts being read in students' textbooks. If key reading skills, comprehension strategies, and language features cannot be exemplified initially with the texts being read in class, then either the textbook does not complement students' needs (and should be reevaluated) or the skills, strategies, and language features targeted for instruction may not be as important as assumed. Moreover, working initially from passages in students' textbooks provides teachers with opportunities to supplement course materials—to address additional reading skills—without diverting (too much) from the textbook. Fourth, students need to have successful reading experiences; a steady diet of frustration with L2 reading leads to student disengagement. Fifth, and finally, some actual reading of texts should be included in every class session; too often, this practice is overlooked, neglected, or forgotten.

It is worth noting, in these closing comments, that our 14 principles cannot possibly apply equally across all L2 student groups or instructional settings, given the diversity of our students, resources, programs, locations, and goals. It would be unrealistic to devote equal time to all 14 principles at every curricular level. Prioritizing certain curricular principles over others is the responsibility of reading teachers, curriculum designers, material designers, and language program administrators, who must strive to find the proper balance among the 14 principles to meet students' evolving abilities across the curriculum. Emphases among the principles should shift as students move from beginning reading proficiency levels to more advanced reading abilities. The aim is to prioritize the principles that benefit students the most as they become more skilled readers. Despite these caveats, the evidence-based principles that we have introduced in this chapter represent excellent starting points for those reviewing, renewing, or developing second language reading curricula (see Lesaux, Galloway, & Marietta, 2016).

Quote 5.12

> [Curriculum planning is] about designing a long-term plan for teaching and learning. Envisioning curriculum design this way has research findings at its core: we know that it

> takes multiple, varied learning opportunities to build advanced literacies skills, across time and different contexts.
>
> Lesaux, Galloway, and Marietta (2016, p. 102)

Our 14 curricular principles are not to be confused with the teaching ideas presented in the next chapter (Chapter 6). The principles, however, can assist teachers in deciding which techniques to incorporate into instruction, taking into consideration students' needs, proficiency levels, and institutional constraints (e.g., instructional time and reading resources available, mandated textbooks, teacher responsibilities). Language programs that draw upon these principles for their reading curricula can expect more effective approaches to reading instruction.

Appendix 5-A: Common Signals and Transition Words

Cause, result, or consequence signals (this is why it happened): as a consequence, as a result, because, caused by, consequently, due to, for, for this reason, if, if … then, impact of, outcome of, resulting from, so, so that, then, therefore, thus, unless, until, whether, without, yet

Comparison signals (we will now show how ideas A and B are alike): alike, also, and, as well as, best, both, comparable, either, equivalent, identical, in the same manner/way, just as, like, much as/like, same, similar to, similarly, too

Conclusion signals (this ends the discussion and may have special importance): as a result, consequently, finally, from this we see, hence, in closing, in conclusion, in short, in sum, in summary, last of all, therefore, to conclude

Continuation signals (pay attention: there are more ideas to come): a final reason; additionally; again; also; and; and finally; another; first of all; first, second, and so on; furthermore; in addition; last of all; likewise; more; moreover; next; one reason; other; secondly

Contrast signals (we will now show how ideas A and B are different): although, but, conversely, despite, different from, even though, however, in contrast, in spite of, instead of, less than, more than, nevertheless, on the contrary, on the other hand, opposite, otherwise, rather, though, unlike, while

Emphasis signals (pay attention: this is important): above all, a central issue, a distinctive quality, a key feature, a major development/event, a primary concern, a significant factor, a vital force, equally important, especially, important to note, more important, most noteworthy, most of all, of course, pay particular attention to, remember that, the main reason, without a doubt

Example signals: for example, for instance, in the same way as, much like, similar to, specifically, such as, to illustrate

Hedging signals (fuzzy signals): alleged, almost, could, except, if, looks like, maybe, might, nearly, probably, purported, reputed, seems, should, sort of, was reported, was suggested

Non-word emphasis signals: bold type, bulleted points, exclamation point, italics, graphic illustrations, numbered points (1, 2, 3), quotation marks, underlining

(*Continued*)

Sequence signals (there is an order to these ideas): A, B, C; after; always; at first; at the end; before; during; earlier; first, second, third; finally; followed by; immediately following; in the beginning; later; later on; next; now; on time; since; then; until; while

Spatial signals (these tell the location or where it is happening): about, above, across, adjacent, alongside, around, away from, behind, below, beside, between, beyond, by, close to, east, far, here, in, in back/front of, inside, into, left, middle, near, next to, north, on, opposite to, outside, over, south, there, to the left, toward, under, within

Summary signals (here's the short version): as has been noted, as I have shown, in brief, in short, in sum, in summary, overall, to sum up, to summarize

Time signals (when is it happening?): after, after a while, already, always, at the same time, before, during, finally, following that/this, immediately, lately, later, little-by-little, meanwhile, now, once, prior to, then, when, yesterday

NB: The signal words listed here could be categorized differently. For more fine-tuned distinctions, see, for example, Biber, Johansson, Leech, Conrad, & Finegan (1999).

Adapted from Kress & Fry, 2016, pp. 410–414.

Appendix 5-B: Common Reading Strategies

Global Reading Strategies[1]	*Monitoring Reading Strategies*
Planning and forming goals for reading**	Checking comprehension*
Reading selectively according to goals	Re-reading**
Previewing*	Identifying reading difficulties
Predicting**	Taking steps to repair faulty comprehension (e.g., re-reading, looking forward or backward, checking illustrations, pausing and posing questions, pausing to subvocalize main idea, considering prior knowledge)
Checking predictions (confirming, rejecting, or modifying)	Judging how well objectives are met
Posing questions*	Reflecting on what has been learned from the text
Finding answers to posed questions*	*Support Reading Strategies*
Connecting text to background knowledge*	Using the dictionary
Identifying important information/ main ideas	Taking notes**
Paying attention to text structure*	Paraphrasing**
Using discourse markers to see discourse relationships	Translating (mentally)**
Connecting one part of the text to another	Underlining or highlighting
Making inferences	Using graphic organizers*
Creating mental images*	Synthesizing*
Guessing meaning from context	
Summarizing*	
Critiquing the author, the text, feelings about the text	

[1] Three broad categories adapted from Mokhtari & Sheorey (2008).

* Empirically validated reading strategies.

** Indirectly supported reading strategies used in validated multiple-strategy instruction.

Appendix 5-C: Principles That Should Permeate Curricula Committed to Reading-Skills Development

Core Reading-Curriculum Principles	
Principle 1	Asking students to read a lot, read often, and read for well-defined purposes, rather than read for no purpose at all, should guide instruction across the reading curriculum.
Principle 2	Incorporating deliberate practice into reading curricula supports reading-skills development and accelerated learning.
Principle 3	Promoting discussion among students about text comprehension is essential for the development of strategic readers.
Principle 4	Building student motivation to read is essential.
Reading-Skills Development Principles	
Principle 5	Making a commitment to vocabulary teaching and learning is foundational to students' reading success.
Principle 6	Raising students' discourse structure awareness and teaching them how to use that knowledge to improve their reading comprehension should be regularly addressed in reading lessons.
Principle 7	Addressing reading fluency, at word and passage levels, is essential for efficient reading comprehension abilities.
Principle 8	Training strategic readers is more effective than teaching reading strategies one at a time.
Instructional-Design Principles	
Principle 9	Teaching (rather than testing) for main-idea comprehension should be a standard component of classroom instruction.
Principle 10	Structuring reading lessons around a pre-reading, during-reading, and post-reading framework should guide class planning.
Principle 11	Selecting and adapting texts should be driven by students' proficiency levels, current and future reading needs, and interests.
Principle 12	Addressing students' digital-literacy skills responds to students' present-day and future reading needs.
Principle 13	Connecting reading to writing prepares students for the realities of most academic contexts.
Principle 14	Assessing students' reading progress is an essential part of teaching, curriculum development, and student learning.

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The following additional citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Content-based instruction*, see Fitzsimmons, Grabe, and Stoller (2017), Grabe and Stoller (2019), Stoller and Grabe (2017).
- *Discussion*, see Garas-York, Shanahan, and Almasi (2013).
- *Extensive reading (and MReader)*, see T. Robb (2015), T. Robb and Kano (2013), Yamashita (2013).

- *Extensive Reading Foundation*, see http://erfoundation.org/wordpress/; *lists of graded readers and links to graded-reader publishers*, see http://erfoundation.org/wordpress/graded-readers/graded-reader-list/; *1,000s of graded-reader quizzes, used to monitor and assess students' extensive reading*, see http://moodlereader.org/.
- *Fluency*, see Lems (2012).
- *Literacy skills curricula*, see Fisher and Frey (2019), Klinger, Vaughn, Boardman (2015), Lee (2017), Lesaux, Galloway, and Marietta (2016), Peregoy and Boyle (2016).
- *Motivation*, see O'Brien and Dillon (2014), Rush and Reynolds (2014).
- *Reading for academic purposes*, see Alexander, Argent, and Spencer (2008), N. J. Anderson (2015), Charles and Pecorari (2016), de Chazal (2014), Evans, Anderson, and Eggington (2015), Hartshorn, Evans, Egbert, and Johnson (2017).
- *Vocabulary*, see Gardner and Davies (2014), Graves, August, and Mancilla-Martinez (2013), Kame'enui and Baumann (2012).

Notes

1 Assessments *of* student proficiency typically involve standardized tests; the results of such tests are used to sort students by proficiency levels.
2 Achievement tests aim to determine how well students have learned skills or content that has been taught. These tests are given to students at the end of instructional units, at the end of a course, or at set points in the curriculum.

6 Teaching L2 Reading Using Evidence-Based Practices

This chapter focuses on effective teaching practices for L2 reading-skills development, building upon insights gained from reading research (introduced in Chapters 1–4) and reading curriculum-design principles (introduced in Chapter 5). The chapter also serves as a bridge between the research introduced in the earlier parts of the book and the teacher-initiated action research projects suggested in Chapters 7–9. Of particular interest are the sets of evidence-based instructional practices that support the development of L2 reading abilities and that can be adapted for a range of L2 instructional contexts:

- Teaching techniques organized by *core reading-curriculum principles*.
- Teaching techniques organized by *reading-skills development principles*.
- Teaching techniques organized by *instructional-design principles*.

Explicit reading instruction can make a difference. In this chapter, we describe evidence-based teaching ideas that can (a) be incorporated into existing reading instruction, (b) form the foundation for new reading curricula, or (c) be adapted for textbook- and materials-development efforts. We have organized our teaching ideas into three sets, aligned with the 14 principles introduced in Chapter 5: (a) core reading-curriculum principles; (b) reading-skills development principles; and (c) instructional-design principles. Some sample activities interspersed throughout the chapter are built upon a reading passage from an L2 reading textbook to illustrate how easily supplementary reading-skills development activities can be created with passages that L2 students read for their classes. At various points in the chapter, we refer to action research projects, described in Chapters 7–9, that extend directly from and support the teaching practices introduced in this chapter.

6.1 Core Reading-Curriculum Principles Translated into Practice

In this section, we introduce instructional practices that are aligned with the four *core reading-curriculum principles* introduced in Chapter 5. These principles

center on the importance of reading frequency, amount, practice, discussion, and motivation.

6.1.1 Ask Students to Read a Lot, Read Often, and Read for Well-Defined Purposes

Our first core reading-curriculum principle suggests that students master reading abilities by reading a lot, reading often, and reading for well-defined purposes. It sounds so simple, yet most reading programs do not equate instruction with actual silent reading time. Teachers can translate this principle into practice in numerous ways; three examples follow.

6.1.1.1 Design Classes So That Students Read a Lot and Read Often

There is no way to get around the fact that students become good readers only by reading a lot and reading often. At all curricular levels, students should be reading a combination of (a) easy and enjoyable texts (e.g., graded readers), as is advocated by the Extensive Reading Foundation,[1] and (b) appropriately challenging (but not frustrating) texts. With easy and enjoyable texts, students are engaged, experience fluent reading, reach high levels of comprehension, and feel the satisfaction that comes from successful reading encounters. With appropriately challenging texts, students also benefit from the explicit **scaffolded instruction** provided by their teachers that guides them in actively and purposefully using (and practicing) the strategies that skilled readers use to comprehend challenging texts.

Making a commitment to reading amount and reading frequency at all curricular levels requires (a) allotting class time for reading, (b) asking students to read at home, (c) allocating resources for reading materials, (d) planning for explicit reading instruction, and (e) making an effort to motivate students to read at every reasonable opportunity. Because reading comprehension abilities develop incrementally, students benefit from being reminded regularly of the importance of reading a lot and reading often.

6.1.1.2 Integrate Scaffolded Silent Reading Regularly into Instruction

Engaging students in reading a lot and often, when paired with **Scaffolded Silent Reading (ScSR)** rather than with **Sustained Silent Reading (SSR)**,[2] improves conditions for reading practice, reading engagement, and reading improvement. ScSR makes use of silent reading practice with level-appropriate texts, coupled with teacher guidance, periodic teacher monitoring of and interaction with individual students, and accountability measures (e.g., book response assignments). Teachers who use ScSR effectively (a) guide students in selecting appropriately challenging and interesting reading materials, (b) monitor students' ability to read the books that they have selected, (c) observe students' "stamina to remain engaged in reading during allocated silent reading practice time," and (d) engage

students in one-on-one reading conferences (Reutzel, Jones, & Newman, 2010, p. 146). Adhering to these guidelines ensures student engagement and accountability during silent reading.

Quote 6.1

> Independent, silent reading practice [using Scaffolded Silent Reading techniques] actively involves teachers in structuring, guiding, teaching, interacting with, monitoring, and holding students accountable for time spent reading independently and silently.
>
> Reutzel, Jones, and Newman (2010, p. 146)

6.1.1.3 Engage Students in Purposeful Reading and Re-reading

Too often students are asked to read, in and out of class, for no particular purpose. When teachers direct students to "read pages 21–23 for tomorrow," "turn to page 43 and begin reading," or "now that we have reviewed this vocabulary, you are ready to read," teachers are assigning purposeless reading. Such assignments do not approximate skilled-reader behaviors because skilled readers do not ever read without a purpose. Similarly, students are rarely asked to re-read texts, despite the fact that the **re-reading** of familiar texts is a common skilled-reader behavior and one of the best ways to build reading fluency. What typically occurs in reading classes? Upon completion of a textbook chapter, the teacher usually directs students to turn to the next chapter instead of giving them a new reason for re-reading the text. Even in the middle of a textbook unit, students are rarely given a reason to return to the text, even though many tasks could lead to purposeful re-reading. Teachers should work meaningful re-reading tasks into their lessons to provide students with opportunities to, at a minimum, simulate skilled-reader habits, build reading fluency, practice an array of useful reading strategies, and consolidate vocabulary learning through repeated encounters with lexical items. Table 6.1 itemizes a sampling of purposes for which students can be asked to read and re-read.

6.1.2 Incorporate Deliberate Practice into Reading Instruction

Our second core reading-curriculum principle emphasizes the importance of deliberate practice. Because L2 textbooks rarely include tasks that lead to deliberate practice, teachers should supplement textbook materials with such guided practice and redefine their roles to include serving as students' *reading coaches*.

6.1.2.1 Coach Students during Deliberate Practice

Deliberate practice is different from the more traditional notion of practice referred to in the language-teaching literature. The best way to think about

Table 6.1 A Sampling of Authentic Purposes for Reading and Re-reading

Purposes for Reading	*Purposes for Re-Reading*	
• Achieve general comprehension • Critique/evaluate • Experience enjoyment • Identify main ideas (skim) • Integrate information with another information source • Learn • Search for simple information (scan) • Write	• Apply, compare, clarify, and explore relationships among ideas • Confirm main ideas, answers to post-reading questions, inferences • Connect or find points of agreement or disagreement with another information source • Consolidate understanding of a difficult section of a text or a key concept	• Determine author stance, bias, position • Extend knowledge • Fill in a graphic organizer (that reflects text organization) • Locate details, discourse markers • Prepare for a follow-up activity (e.g., a summary, synthesis, quiz, oral presentation, jigsaw activity, debate)

deliberate practice is by considering individuals who become experts in skills such as skiing, playing the piano, playing chess, and figure skating. These individuals engage in deliberate and consistent practice while understanding what their aims are—and all have coaches (see Allington, 2009; Ericsson & Pool, 2016). As stated by Ericsson and Pool (2016),

> Deliberate practice is informed and guided by the best performers' accomplishments and by an understanding of what these expert performers do to excel. Deliberate practice is purposeful practice that knows where it is going and how to get there.
>
> (p. 98)

Deliberate practice builds not only automaticity in the skill being mastered but also mental representations of task performance, skills, and goals, developed with the help of masterful coaches (i.e., teachers). Feedback and modification of effort, in response to feedback, are essential components of deliberate practice.

Reading teachers should strive to become students' reading coaches. To do so, teachers must understand the behaviors of "expert" (skilled) readers (as explained in this volume) and then guide students in deliberately practicing those behaviors, all the while pushing students beyond their comfort zones (i.e., their current abilities). Whether students' reading coaches focus deliberate practice on main-idea comprehension, reading fluency, discourse structure awareness, strategy use, monitoring of comprehension, inferencing, or making connections across parts of a text or multiple texts, teachers must be sure that their students are fully conscious of and can concentrate on what they are trying to attain. Like good coaches, teachers should monitor student progress, provide suggestions for improvement, and then make opportunities available for modifications in

behavior, with additional rounds of deliberate practice (and assessment for learning; see Section 6.3.6).

Students can eventually self-monitor their reading only if they have mental representations of what they are trying to achieve (in deliberate practice and independent reading). As is evident, the concept of deliberate practice requires a new conceptualization of reading teachers' roles. We hope that we have made a persuasive case for the need to build our own skill sets so that we can serve as our students' reading coaches. (See Munger & Murray, 2014; see also Model Action Research Project 8.1.1, which centers on deliberate practice.)

Quote 6.2

> Much research indicates that 'deliberate' and extended practice is a more likely explanation for … wide variations in performances. In other words, it is the amount (volume) of deliberate practice that explains exceptional levels of skilled performances rather than some innate characteristic of particular high-performing individuals.
>
> Allington (2009, p. 33)

6.1.2.2 Model Skilled-Reader Behaviors through Teacher Think Alouds

One way to model skilled-reader habits, and then guide students in deliberate practice of those aspects of reading, is to use teacher **think alouds**. There is evidence that teachers can, for example, raise students' awareness of reading strategies and how they work together by verbalizing strategy use while reading passages aloud to the class (Wilhelm, 2012). The same could be done to model the recognition and use of discourse structures to enhance text comprehension or to model the use of context clues to determine the meaning of new lexical items. Think-aloud scripts, planned ahead of time, embed teacher verbalizations of reading behaviors being modeled (e.g., reading strategies) into reading passages. While the teacher reads aloud his or her script, students read along silently with the textbook passage. Class discussions of the skilled-reader behaviors "observed" can be followed by students' deliberate practice of those behaviors. (See Table 9.2 for a sample teacher think aloud; see also Model Action Research Project 9.1.1 centered on teacher think alouds.)

6.1.3 Incorporate Discussion into Reading Instruction

Our third core reading-curriculum principle focuses on the importance of regular classroom discussions, done in student pairs, student groups, and as a whole class. Discussions can center on what students are reading (or have read) or on how main-idea comprehension is achieved. We offer a few suggestions here for incorporating purposeful discussion into reading instruction; other effective uses of discussion are advocated later in the chapter, in an exploration of teaching

techniques to build student motivation to read (Section 6.1.4), promote vocabulary learning (Section 6.2.1), raise students' discourse structure awareness (Section 6.2.2), train strategic readers (Section 6.2.4), teach for main-idea comprehension (Section 6.3.1), and encourage student reflection on feedback received (Section 6.3.6). (See Duke & Martin, 2019, for a review of three approaches to discussion of informational texts.)

6.1.3.1 Engage Students in Classroom Conversations about Reading

Conversations about reading should not be viewed as substitutes for reading itself, but they can be motivational. As part of these conversations, the teacher

- Talks about what he or she likes to read, is reading, and why it is interesting.
- Finds out what students like to read and why.
- Encourages students to talk about what they like to read, even when those texts are "marginalized genres" (Wilhelm & Smith, 2016; i.e., texts not normally read in class such as comic books and graphic novels).
- Praises students for sharing what they are reading, explaining why they find it interesting, and making reading recommendations to classmates.
- Shares new library acquisitions with the class and encourages students to guess what they might be about.
- Reads an interesting text aloud to the class and then guides a whole-class conversation about it (or asks students to discuss it in groups).

6.1.3.2 Incorporate Meaningful Discussions of Main-Idea Comprehension into Instruction

Main-idea comprehension abilities can be developed through pair, small-group, and whole-class discussions during which students identify and explore main ideas in the texts that they are reading (Beck & Sandora, 2016b; Fisher & Frey, 2019; Garas-York & Almasi, 2017; Guthrie & Klauda, 2016). Discussions centered on main-idea comprehension may start with textbook post-reading comprehension questions, but they are followed by requests for further elaboration, during which students answer *why*, *where*, and *how* questions:

- *Why* questions oblige students to explain *why* their answers are appropriate, thereby leading to an exploration of main ideas, text recall, inferencing, and coherence building (i.e., making connections across parts of the text).
- *Where* questions require students to return to the text, re-read, and point out *where* the text supports their answers.
- *How* questions encourage discussions of *how* to understand the text better and the reading strategies used to do so.

During discussions, students can also be guided to note connections across parts of the text, between two or more texts, or between the text and their own background knowledge.

6.1.4 Build Students' Motivation for Reading

Our fourth core reading-curriculum principle emphasizes the importance of building student motivation for reading. Research has consistently shown that motivation and positive attitudes toward reading lead to enhanced reading engagement, improved reading abilities, better reading comprehension, greater amounts of reading, and increased confidence (Guthrie & Taboada Barber, 2019; see also Komiyama, 2009, 2013). Sadly, frustrating (and therefore demotivating) reading experiences are not uncommon in L2 classrooms. In the following sections, we offer suggestions for motivating students to read. (See Model Action Research Project 8.1.2, which focuses on building student motivation.)

Quote 6.3

> Every teacher is a motivator. Teachers empower students to become active with print. Otherwise reading never happens. At the same time, motivating students to their fullest is rare. When students become interested, confident, and dedicated, almost every teacher is rewarded.
>
> Guthrie and Taboada Barber (2019, p. 69)

6.1.4.1 Provide Motivational Support Regularly

Teachers can provide motivational support in reading lessons in many ways, itemized below. (The first four points complement deliberate practice conventions, discussed in Section 6.1.2.)

- Teachers make sure students understand the purpose(s) for the reading-skills development activities that they engage in.
- Teachers guide students in setting realistic reading and task-completion goals.
- Teachers provide regular feedback on student progress (see also Section 6.3.6).
- Teachers guide students in discovering what they have actually learned *from* reading. In this way, students gain an appreciation for reading. (The connection between reading skill development and content learning is developed further in Section 6.1.4.2.)
- Teachers promote cohesiveness among learners—with pair work, group work, and classroom discussions—to build a sense of community, making

it easier for students to support each other with challenging reading texts and tasks.

- Teachers encourage active participation among students; student engagement leads to higher levels of motivation and enjoyment.
- Teachers set up students for success by (a) selecting texts that are accessible to students (with scaffolded instruction, when necessary) and (b) devising reading tasks that students are capable of completing. Texts and tasks should involve enough challenge to require some effort to increase students' expectancy of success.
- Devising attention-catching introductions to major texts and tasks to build student interest and increase relevance (e.g., by sharing eye-catching visuals in the text or supplementary ones related to the reading passage; posing thought-provoking questions; connecting the text to students' lives, prior knowledge, experiences, and interests; or showing a short video related to the text).
- Teachers help students build their knowledge about reading topics, that is, some level of content expertise, by bringing in supplementary passages (and other content resources) that connect to textbook content.
- Teachers give students "mini-choices" with texts *and* related tasks (Guthrie & Klauda, 2016, p. 48; Guthrie & Taboada Barber, 2019). For instance, students can be given a choice between two supplementary texts brought in to build upon textbook content (mentioned above). Or when the teacher assigns a particular text, students can be given the choice of which character, event, issue, time period, or problem/solution to focus on while reading.
- Teachers hold students to high expectations, drawing upon Eccles and Wigfield (2002) who have shown a significant association between teachers' expectations of students and students' growth in reading achievement.

Quote 6.4

> Motivation activities should accelerate amount and depth of reading by 200–500% …. Classroom contexts energize motivations … ; motivations energize engagement behaviors … ; and engagement fuels achievement. … Quantity of engaged reading is a vitally important individual difference variable, with some students much higher than others. When classroom contexts foster [quantity of engaged reading] for everyone, the associated factor of achievement is likely to increase for all students.
>
> Guthrie and Klauda (2016, p. 51)

6.1.4.2 *Make a Dual Commitment to Reading Skills Development and Content Learning*

Helping students appreciate what is learned from reading (noted in the previous bullet points) can be achieved with instructional approaches that

make a dual commitment to language and content learning. Content-based approaches to language teaching do just that: they include Content-Based Instruction (CBI; Snow & Brinton, 2017), **Content and Language Integrated Learning** (**CLIL**; Dalton-Puffer, 2017), Collaborative Strategic Reading (CSR; Boardman, Boelé, & Klinger, 2017; Klinger, Vaughn, Boardman, & Swanson, 2012), and Concept-Oriented Reading Instruction (discussed in the following paragraphs).

Content-based approaches (Concept 5.1) naturally lead to opportunities for extended reading, motivational learning experiences, strategic responses to increasingly complex tasks, greater choices in reading materials, and increased challenges to match students' growing skills (Fitzsimmons-Doolan, Grabe, & Stoller, 2017; Stoller & Fitzsimmons-Doolan, 2017). Content-based approaches also lend themselves to the recycling of reading skills, the re-reading of texts, and realistic tasks for interpreting, integrating, and evaluating information from multiple texts (Grabe & Stoller, 2019). Such tasks mirror the demands of reading in academic contexts. Evidence from L1 reading contexts has empirically demonstrated the effectiveness of content-based approaches (e.g., Guthrie, Klauda, & Ho, 2013).

Concept-Oriented Reading Instruction (CORI) provides an excellent example of an approach that promotes reading skill development, content learning, and motivation. The CORI framework, used and researched extensively in L1 settings (e.g., Guthrie & Klauda, 2014), can be easily adapted for L2 students. It was initially guided by instructional principles for stimulating student interest and motivation to read and has since evolved into a more elaborate yet flexible approach organized around four stages:

- Immersion into a main theme through students' personal engagement with the topic and the exploration of a "big question."
- Wide reading and information gathering on the theme across multiple information sources.
- Reading strategy instruction to assist with comprehension.
- Project work leading to tangible outcomes that demonstrate what students have learned.

In implementing the four CORI stages, students engage in discussions and activities that require the purposeful use of multiple strategies (e.g., activating background knowledge, forming and answering questions, determining main ideas, noting text structure, taking notes, monitoring and repairing comprehension, summarizing, paraphrasing, synthesizing information). These strategies, developed as part of explicit instruction while students are reading texts to find information related to their projects, are accompanied by consistent teacher modeling, teacher **scaffolding**, student discussions, and practice. In addition to reading-strategy training, CORI is committed to students' vocabulary development, fluency practice, discourse structure awareness, and extensive reading. Student–student collaboration, too, is central to the motivational support provided by the

CORI framework. Collaboration, which is meant to occur in every CORI lesson, is achieved through activities such as reading with a partner, exchanging ideas and sharing expertise, collaborative reasoning, student-led discussion groups, team summaries, **jigsaw reading** activities, and peer feedback (Guthrie & Taboada Barber, 2019). Studies on the effectiveness of the CORI approach have shown that (a) effective instruction builds motivation, (b) motivation initiates engagement, and (c) engagement leads to achievement (e.g., Guthrie et al., 2013).

6.2 Reading-Skills Development Principles Translated into Practice

In Chapter 5, we introduced four *reading-skills development principles*, centered on the importance of vocabulary, discourse structure awareness, reading fluency, and strategic reader training. In the sections that follow, we introduce instructional practices aligned with each principle.

6.2.1 Make a Commitment to Students' Vocabulary Growth

Quote 6.5

> Given the importance of vocabulary to success in reading and the fact that many English language learners have vocabularies significantly smaller than those of their native English-speaking classmates, it is vital that long-term, sustained efforts be developed and implemented.
>
> Graves, August, and Mancilla-Martinez (2013, p. 139)

Substantial evidence suggests that vocabulary knowledge is closely related to reading abilities (Graves, August, & Mancilla-Martinez, 2013; Jeon & Yamashita, 2014; L. Robb, 2014). This body of research indicates persuasively that explicit vocabulary instruction and practice, with large sets of words, are essential to increase L2 students' vocabulary knowledge. To institute an active vocabulary-development framework, teachers should make use of techniques for teaching new vocabulary, recycling vocabulary, building layers of vocabulary knowledge, and increasing student motivation for independent vocabulary learning (Table 6.2; see also Appendix 7-A for a list of explicit vocabulary teaching techniques; see also Model Action Research Project 8.1.3, which focuses on encouraging students to become word collectors). It is also worth noting that repeated reading, typically advocated for improvements in reading comprehension and reading fluency (explained further in Section 6.2.3.2), has been shown to assist with students' vocabulary learning as well (Webb & Chang, 2012).

Table 6.2 Vocabulary Teaching Techniques (Italicized Items Explained in Chapter)

A Sampling of Techniques for …		
Teaching New Vocabulary	*Recycling Vocabulary and Building Layers of Vocabulary Knowledge*	*Increasing Student Motivation for Independent Vocabulary Learning*
• *Focus on words selected to teach* • Bring in or draw pictures • Build concept-of-definition maps • Guide learners in consulting (learner) dictionaries • Explain with a story or anecdote • Guide students in word analysis • Juxtapose new vocabulary with known antonyms and synonyms • Provide easy-to-understand definitions • Translate • Use graphic displays and clustering techniques to show new word(s) in relation to known words	• Build a word wall and engage students with it • Guide students in sorting words into meaningful groups (e.g., action words, words with positive and negative connotations, subject-area words) • Create matching and ranking activities • Engage students in discussions and writing tasks that encourage the use of key vocabulary • Teach collocations and connotations • Teach word families • Use a word splash to engage students in vocabulary sorting	• Teach vocabulary-learning strategies, including the use of – flashcards – context clues (when present) – glosses – visuals in texts – vocabulary notebooks – word-part analyses

In the sections that follow, we introduce ideas for building a strong vocabulary-development framework. These techniques, used alone and in combination, are certainly more effective than simply asking students to memorize words, a technique mentioned all too frequently by teachers as their predominant vocabulary teaching tool.

6.2.1.1 Select Systematically Vocabulary Items That Merit Explicit Instruction

Teachers need to decide which words to teach systematically because they cannot possibly teach students all the words that they need to know. Textbooks often pre-teach or gloss key vocabulary, but other words in the texts that students read are usually worthy of explicit attention. One way for teachers to select vocabulary for explicit attention is by categorizing lexical items likely to be unfamiliar to students into four categories, as shown in Figure 6.1. Lexical items falling into the + + (plus–plus) category are excellent "candidates" for explicit instruction. Words categorized as – – (minus–minus) do not merit instructional time. Teachers must

Evaluation Criteria for Vocabulary Likely to Be Unfamiliar to Students		⇨	**Lexical Items Worthy of Explicit Instruction**	
Word/Phrase Critical for Text Comprehension	Word/Phrase Useful Beyond the Text Being Read			
+	+		Plus–Plus (+ +)	**High Priority**
+	–		Plus–Minus (+ –)	↓
–	+		Minus–Plus (– +)	↓
–	–		Minus–Minus (– –)	**No priority**

Figure 6.1 Systematic way for teachers to identify lexical items worthy of explicit attention.

decide how much time to devote to words categorized as + – (plus–minus, those words critical for text comprehension) and then consider words categorized as – + (minus–plus, generally useful words). Teachers are also advised to use corpus tools (e.g., www.lextutor.ca, www.academicvocabulary.info) to inform meaningful vocabulary selection. (See He & Godfroid, 2019, for other views on vocabulary selection.)

6.2.1.2 *Build Concept-of-Definition Maps with Students*

One way to introduce a new key word and connect it to what students already know is to "build" a concept-of-definition map with the class (Figures 6.2a and 6.2b). With concept-of-definition maps, students view a key word from four vantage points, providing students with one or more perspectives to help them remember and build their understanding of the word.[3] A concept-of-definition map is most useful for a key word that associates with several other words in a text.

6.2.1.3 *Create a Vocabulary-Rich Classroom Environment to Support Learning*

Teachers can promote vocabulary learning by creating a vocabulary-rich classroom environment in which they place students' written work, interesting newspaper and magazine articles, information from the Web that will catch students' attention, book covers of new library acquisitions, song lyrics, and so forth on classroom walls and bulletin boards.

Another way to create a vocabulary-rich classroom environment is to place key words and phrases from core readings on a classroom wall (Concept 6.1), poster board, or bulletin board (Eyraud, Giles, Koenig, & Stoller, 2000; Green, 2003). The words are written on strips of paper large enough to be seen from across the room. They can be accompanied by a picture or drawing that helps students remember the meaning encountered. The simple placement of vocabulary items on the word wall, however, is insufficient. There should also be classroom

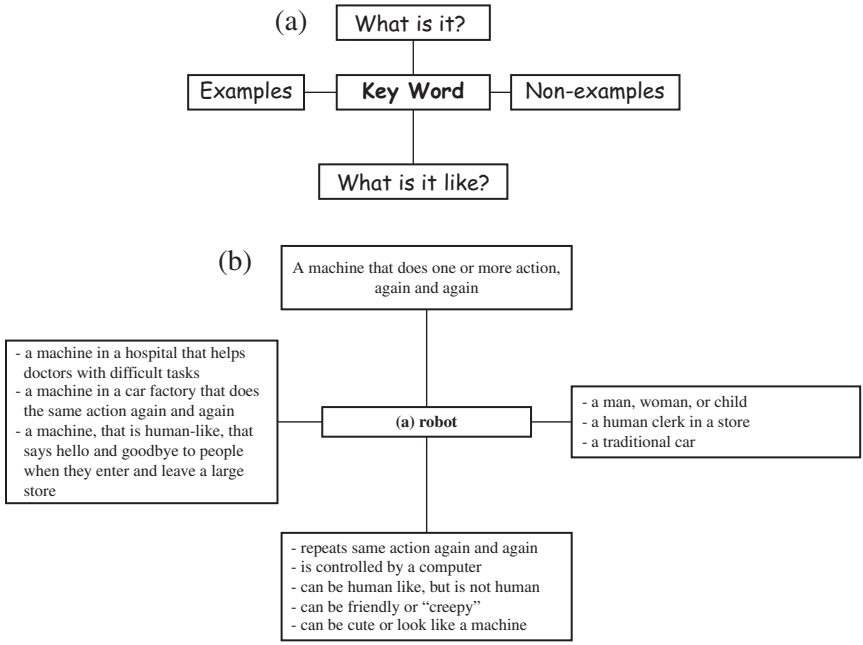


Figure 6.2 Generic concept-of-definition map (a) and vocabulary-specific concept-of-definition map (b) for a keyword in Savage (2017).

activities that oblige students to use words on the word wall in engaging ways (e.g., with speed writes, crossword puzzles, ranking activities, spontaneous speaking tasks, dialogues, and role plays). To assist students in learning the words and seeing relationships among them, students can move words around the wall to create meaningful word clusters (e.g., groups of words that belong to a particular content area; synonyms and antonyms; words from the same parts of speech or word families; words with positive or negative connotations; two- and three-word **collocations**).

Concept 6.1: Word Wall Approach

A word wall approach to vocabulary building involves the display of key words and phrases on a classroom wall for easy student reference. Words can be organized by part of speech, thematic unit, collocations, connotations, interesting word groupings (e.g., synonyms, antonyms), and so forth. Word strips or wall panels can be color coded to assist students with vocabulary learning (with colors connected to textbook chapters, thematic units, or the different classes in which they are enrolled). The simple display of

words (selected by the teacher and/or students), however, does not guarantee vocabulary learning. The key is to return to the word wall and engage students in tasks that involve the meaningful use and/or manipulation of words on the wall. The placement of a picture or drawing near a word entry, which brings to mind the meaning encountered, assists students in learning the vocabulary.

6.2.1.4 *Use Word Splash and Sorting Activities to Build Layers of Vocabulary Knowledge*

Word splashes, which *randomly* display lexical items on the board or PowerPoint slide, lend themselves to sorting activities in addition to useful discussions of key word associations, thereby providing opportunities for recycling and building layers of knowledge. After a word splash is created by the teacher, jointly with students who nominate entries from a text or topic, students cluster related words from the word splash and label each group of words with an overarching category label. When used as a pre- or post-reading task, students engage in active discussions about words, concepts, and their relationships and make meaningful connections among words, and vocabulary items are recycled. The outcome of a word-splash-to-categorization task can be a semantic map that displays (a) main and secondary ideas from one or more reading passages and (b) the relationships between these ideas (Figure 6.3).

6.2.2 *Raise Students' Discourse-Structure Awareness*

Quote 6.6

> Adding DSGO [discourse structure graphic organizers] tasks to the curriculum not only … improve[s] students' knowledge of discourse structures, but also help[s] facilitate the acquisition of other linguistic skills. The incorporation of DSGO tasks into the reading curriculum should be viewed as an effective use of class time.
>
> Jiang (2012, p. 99)

Good readers typically recognize the organization of textual information and cues to that organization (e.g., words that signal rhetorical patterns or topic shifts, transition phrases, headings, paragraphing). Awareness of text organization, or text structure awareness (Concept 5.2), provides readers with tools for achieving text comprehension. Patterns of organization (e.g., chronological order, comparison–contrast, problem–solution, process) frame text information in

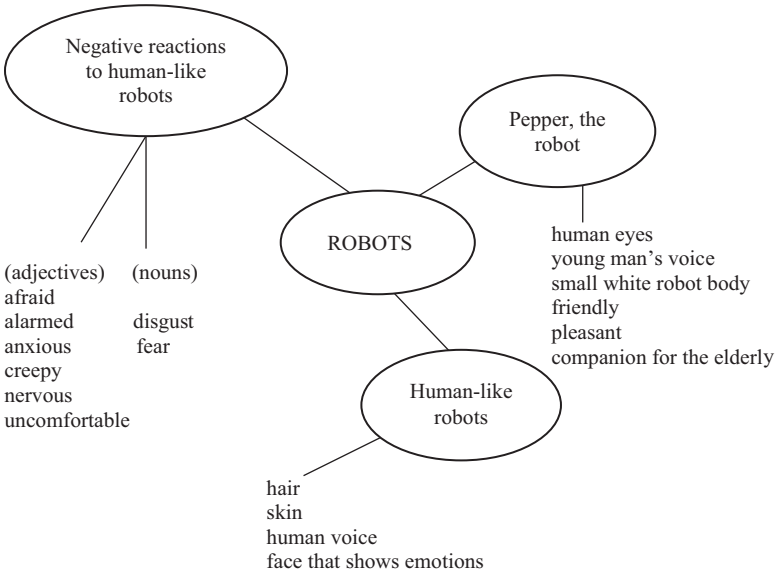


Figure 6.3 Semantic map resulting from a word splash-to-categorization task (to accompany Savage, 2017).

certain ways. When students become aware of these organizational patterns, it is easier for them to identify main ideas. Class discussions about how text information (in a paragraph, full section, or whole text) is organized can lead to collaboration among students to build connections between main ideas and supporting information.

When teachers address discourse structure awareness in class, they should keep these general guidelines in mind. First and foremost, instruction centered on raising students' discourse structure awareness should be consistent and run throughout a reading curriculum. Second, teachers should use the texts that students are already reading so that students see the pervasiveness of discourse structure in all texts; students should not be provided with "model texts" to showcase discourse structure. Third, discourse structure graphic organizers (DSGOs; Jiang, 2012), which clearly display text-specific organizational patterns, serve as exemplary tools for raising students' discourse structure awareness. Finally, students should be given plentiful opportunities to be active participants in discussions of how texts are structured and how discourse structure is signaled (Jiang & Grabe, 2007, 2009). Common classroom tasks for exploring discourse structure at different reading-lesson stages are explained in the following sections. (See Appendix 8-A for sample DSGOs; see also Model Action Research Projects 8.1.4 and 8.1.5, which center on aspects of discourse structure awareness.)

6.2.2.1 Build Discourse-Structure Awareness in Pre-Reading Stage

At pre-reading stages, teachers guide students in (a) examining text headings and subheadings and (b) predicting what each section is about. The goal is for students, over time, to take these steps independently without being directed to do so. Students can also preview pre-selected text sections and highlight key words that signal discourse structure (e.g., first–second–third; on one hand–on the other; therefore). Similarly, students can examine pre-determined paragraphs and decide on their function in the text (e.g., to introduce a problem, propose a solution, make a comparison, explain a step in a process). These activities not only raise students' discourse awareness but also model skilled-reader strategies.

6.2.2.2 Raise Discourse-Structure Awareness in During-Reading Stage

While students are reading, they can be guided to discover text organization features. Depending on the nature of the text being read, teachers can ask students to do the following *while* reading:

- Fill in an outline of the text.
- Complete a DSGO (e.g., a timeline for a passage that is organized chronologically; a flowchart for a passage that explains a process). (See Appendices 6-A and 6-B for a sample student DSGO worksheet and answer key, respectively.)
- Underline lexical clues that indicate major organizational patterns (e.g., cause–effect, comparison–contrast, problem–solution).
- Highlight transition words and phrases that signal new sections (e.g., "And finally" to signal not only continuation but also the last in a series; "conversely" to signal a contrast). (See Appendix 5-A for a partial listing of transition words and phrases.)
- Jot down a brief main-idea label for each paragraph (or sets of paragraphs) in the margin.

6.2.2.3 Develop Discourse-Structure Awareness in Post-Reading Stage

Discourse-structure awareness can be developed further in post-reading discussions and re-reading tasks. Many of the while-reading activities just noted can transition into post-reading tasks. For example, if students have filled in an outline while reading, they can compare outlines and discuss what aspects of the text make each section identifiable as a separate unit. If students have jotted down brief main-idea labels in the margins of a passage while reading, they can compare labels and explore the function(s) of different paragraphs in post-reading tasks. If students have filled in a DSGO while reading, they can explain how the information placed in the graphic organizer was signaled in the text during the post-reading segment of the lesson. In addition, students can be asked to re-read a text to match main ideas and supporting information across two columns. Also effective are tasks that require students to reorganize scrambled paragraphs or sentences to reassemble a text or create a good summary.

6.2.3 Build Students' Reading Fluency at Word, Phrase, and Passage Levels

Reading research has demonstrated that reading fluency development is a critical component of effective and successful reading instruction (Kuhn, Rasinski, & Young, 2019; Nation, 2009). Building word-, phrase-, and passage-level reading fluency requires a commitment at all levels of reading instruction. Although reading amount and frequency (discussed in Section 6.1.1) contribute to students' reading-fluency development, explicit attention to fluency development in class can and does make a difference (Kuhn, Rasinski, & Young, 2019). An occasional reading fluency task squeezed into instruction when time permits or at the end of a textbook chapter is insufficient.

L2 students typically have limited experience with explicit fluency-building tasks because they are rare in L2 reading textbooks. Thus, teachers should explain why the class is working on fluency. Students should understand that the goal of reading is silent reading but that many fluency activities require reading aloud. Reading aloud helps build sound–meaning connections and provides additional exposures to vocabulary and grammatical patterns. When students "buy in" to the need for fluency development, they usually look forward to fluency practice.

In the following sections, we introduce two sets of instructional activities that are easily incorporated into instruction. The first set promotes word- and phrase-recognition efficiency. The second set promotes passage-level reading fluency. Appendix 8-B itemizes a larger set of reading fluency activities for L2 classes with reading-skills development goals.

Quote 6.7

> Fluency development is often neglected in courses, partly because teachers and learners feel that they should always be learning something new. Fluency development involves making the best use of what is already known.
>
> Nation (2009, p. 2)

6.2.3.1 *Promote Word and Phrase Recognition Efficiency (Set I)*

Word- and phrase-recognition fluency can be developed in many ways, including through re-reading tasks, reading along silently in a text as the teacher reads aloud, extensive reading, and **Readers Theater** (Young & Rasinski, 2018). Here we introduce activities that are quite different in nature. These activities, easily created by teachers, focus on actual word and phrase processing, with the goal of developing students' rapid and automatic word- and phrase-recognition abilities. Students generally enjoy engaging in recognition exercises in a beat-the-clock fashion and benefit from keeping track of their progress on record-keeping charts. The exercises showcased here take relatively little class time,

after students understand the general routine. (See Crawford, 2005, and Stoller, 2012, for suggestions on creating recognition exercises and using them in class.)

Integrate word and phrase recognition exercises into instruction. Few L2 reading textbooks include word- and phrase-recognition exercises. Fortunately, teachers can create recognition exercises[4] easily with key vocabulary from the texts that students are assigned to read. A common format for word- and phrase-recognition exercises is shown in Figures 6.4 and 6.5, respectively.

Engage students in timed semantic connection exercises. Another way to promote quick lexical access is to create exercises with key words that are *already* familiar to students. As shown in Figure 6.6, students, under timed conditions, consider the key word (on the left) and multiple choices (to the right) with the aim of selecting the one word that is (a) topically related to the key word (as in 1), (b) similar in meaning (as in 2), or (c) a common collocate of the key word (as in 3).

Key word

1. robot	robin	rabbit	robot	robust
2. machine	magician	mechanic	mealtime	machine
3. technology	television	technology	geography	treatment

. . .

Number correct: ___/20

Time: ___ seconds

Figure 6.4 Common word-recognition exercise format (with vocabulary from Savage, 2017).

Key phrase

1. other humans	other homes	other humans	either human	other teams
2. robot voices	robot voices	real voices	rough voices	robot vices
3. in fact	on foot	in fall	in fact	in back

. . .

Number correct: ___/20

Time: ___ seconds

Figure 6.5 Common phrase-recognition exercise format (with vocabulary from Savage, 2017).

Key word					
1. **emotions**	voice	cute	floor	~~sad~~	team
2. **however**	often	also	but	and	usually
3. **make**	a problem	a decision	homework	emotion	a companion

. . .

Number correct: ___/20

Time: ___ seconds

Figure 6.6 Sample semantic connection exercise (with vocabulary from Savage, 2017).

Create lexical access fluency exercises. Students also benefit from lexical access fluency exercises. A variation on the timed semantic connection exercise just introduced, they entail matching of key words (bolded, on the left) with their definitions or synonyms (on the right) under timed conditions (Figure 6.7). Students progress through three sets of the same key words and definitions, though definitions are scrambled in each set, with less time allotted for the completion of each set (e.g., 60 seconds, 50 seconds, 40 seconds). Again, these exercises take little class time, and one three-part set could easily be created for each key reading assignment.

Set 1

disgust	progressed
alarmed	strong dislike
reduce	make smaller
advanced	surprised

. . .

Set 2

disgust	surprised
alarmed	make smaller
reduce	progressed
advanced	strong dislike

. . .

Set 3

disgust	strong dislike
alarmed	progressed
reduce	surprised
advanced	make smaller

. . .

Figure 6.7 Sample lexical access fluency task (with vocabulary from Savage, 2017).

6.2.3.2 Promote Passage-Level Reading Fluency (Set II)

Passage-level fluency can be developed with consistent and purposeful re-reading tasks (Section 6.1.1.3) and also through extensive reading in addition to **timed** and **paced reading** activities. Repeated reading and oral paired reading (introduced shortly) provide additional opportunities for fluency development.

Engage students in repeated reading. Repeated reading (not to be confused with re-reading) has become an important component of L1 reading curricula (Rasinski, 2010; Rasinski, Blachowicz, & Lems, 2012); it is time for L2 teachers to do the same (Gorsuch, Taguchi, & Umehara, 2015; Taguchi & Gorsuch, 2012; Taguchi, Gorsuch, Lems, & Rosszell, 2016). **Repeated reading** is either unassisted or assisted. *Unassisted* repeated reading involves students reading short passages or text segments multiple times—silently or aloud,[5] at school or at home—until they reach a set reading rate. With *assisted* repeated reading, students read a passage multiple times, silently or aloud, with a recording of the passage (on a CD, audiotape, or online), with a teacher, or with a peer. Other options for assisted repeated reading entail first listening to a passage and then reading along (silently or aloud). The following five tips can help teachers initiate a repeated reading routine.

1. Keep passages to between 70 and 200 words.
2. Assign texts that students have *already* read or heard (or that will be easy for them).
3. Limit reading of the same passage to about three times (see Munger & Murray, 2014).
4. Encourage students to read aloud with reasonable accuracy and intelligibly.
5. Ask students to time their reading (from start to finish) or to read for a set number of seconds (60, 90, or 120 seconds), even though in the latter case they may not finish the whole passage. In either case, ask students to record the time spent reading on a progress chart.

Integrate oral paired reading into instruction. Oral **paired reading** is another commonly used fluency-building activity in L1 settings that should be used more often in L2 classrooms. In oral paired reading, students work in pairs with a familiar text so they can focus on reading more quickly each round instead of on meaning and unfamiliar words. An oral paired reading routine that we suggest involves four rounds of oral reading (two rounds for each student), with the goal of advancing further in the same text in the second round. (See Table 8.6; Model Action Research Project 8.1.6 contains the procedures.) After the initial oral paired reading session during which students learn general procedures and expectations, students typically look forward to these activities because they are enjoyable, goal oriented, and helpful for fluency building. (See Jeon, 2012, for more on oral reading fluency.)

6.2.4 Develop the Strategic Reader

Good readers read for well-defined purposes and typically employ multiple strategies (e.g., **previewing**, making predictions, confirming or revising predictions, monitoring comprehension, inferencing) to achieve reading-comprehension

goals (see Appendix 5-B). When good readers' default strategies—used without much conscious attention—do not lead to successful comprehension (which might happen when good readers encounter a challenging text, an unfamiliar genre, or a new topic), a more conscious problem-solving mode of attention is activated. At that point, good readers draw upon a larger set of strategies, which they use in different combinations, to achieve their comprehension goals. In such circumstances, the reader may decide, for example, to re-read the text (or parts of it), reconsider initial predictions, reexamine discourse markers, or try to unravel a complex phrase. In the following sections, we offer other suggestions for strategic-reader training. (See also Model Action Research Projects 9.1.1 and 9.1.2, focused on strategic-reader training.)

6.2.4.1 *Emphasize Strategic-Reader Training*

Helping developing readers become more strategic should be central to comprehension instruction. An emphasis on training strategic readers, instead of teaching individual strategies, is ideal. Strategic-reader training involves (a) guiding students in using multiple strategies for better comprehension and (b) making sure students are familiar with strategic responses to texts, which, with practice and teacher reinforcement, become more automatic over time. Tips for training strategic readers include the following:

- Introduce strategies (in useful combinations) when students are engaged in reading for comprehension; guide students in discussions of *how*, *when*, and *why* to use *which* strategies to achieve reading comprehension goals.
- Place a "label" for each newly introduced strategy (e.g., Preview, Predict) on a "permanent" display (e.g., bulletin board, portable poster) for easy student consultation during class discussions (Figure 6.8).
- Give students opportunities to practice strategies when they serve the purpose of helping students achieve comprehension goals, and encourage students to discuss their use in pairs or as a whole class.
- Model combinations of strategies with a teacher think aloud (i.e., reading a passage aloud and verbalizing strategies being used). Over time, students should be encouraged to verbalize strategies that they are using and then discuss them as ways for understanding texts (Wilhelm, 2012; see Model Action Research Project 9.1.1 for a sample teacher think aloud).

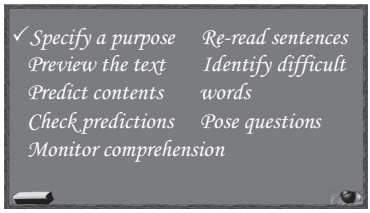


Figure 6.8 Sample display of strategies for in-class consultation.

6.2.4.2 Guide Students in Thinking like Good Readers

Drawing from the Directed Reading–Thinking Activity (DR-TA) approach (Blachowicz & Ogle, 2008), teachers guide students in relating background knowledge to the text, establishing reading goals, and engaging in a series of prediction and summarization tasks at set pause points. The prediction cycle engages students in (a) making predictions about what they think is coming next, (b) reading to confirm or refute their predictions, (c) discussing predictions (in pairs, small groups, and then as a whole class) with the goal of reformulating them if necessary, and (d) summarizing what they have read before moving onto the next text segment. Questions commonly asked to guide such discussions (with adaptations for different student proficiency levels and text types) include the following:

1. What do you predict will happen?
2. What are your reasons for these predictions?
3. What do you think now? How accurate were your predictions?
4. What made you change your mind?
5. Can you find information in the text to support or challenge your predictions?
6. What is the main idea of this section?
7. What do you think will happen next?

When students have difficulties adjusting their predictions as they proceed through the text (possibly because they are unable to make good inferences or connect text segments), the teacher encourages students to re-read particular segments to find information that will improve their predictions.

The successful use of the DR-TA approach (or its adaptation) requires that the teacher (a) determine *how much* text should be read between pauses, during which students revisit, evaluate, and adjust their predictions and (b) ensure that "there is enough information [in the text segment] for the students to check likely predictions, and also enough new information for further predictions to be made" (Blachowicz & Ogle, 2008, p. 140). Another key to successful DR-TA implementation is the realization that prediction is authentic only when the whole class is reading material for the first time. Pausing at page breaks or at the end of a well-defined section might lessen students' temptation to read ahead.

Quote 6.8

> The DR-TA provides the teacher an opportunity to guide students to think like good readers do—anticipating, predicting, and then confirming or modifying their ideas with the story as it unfolds.
>
> Blachowicz and Ogle (2008, p. 144)

6.2.4.3 *Guide Students in Monitoring Their Comprehension*

The monitoring of main-idea comprehension is a critically important reading strategy (Grabe, 2009), yet comprehension monitoring involves much more than the recognition of main ideas and the identification of difficulties being experienced while reading. Strategies that play a major role in the monitoring of comprehension are listed in Table 6.3. Teachers can support reading comprehension monitoring by modeling the strategies, discussing them, guiding students in using them, and leading students in discussions about *when* the students used the strategies, *what* purpose(s) they served, and *how* they helped (N. J. Anderson, 2008).

6.2.4.4 *Help Students Identify Challenging Parts of Texts*

L2 students' academic success depends, in part, on their ability to comprehend challenging texts. Teachers can ask students to identify challenging text segments and guide them in identifying (a) sources of difficulty (Table 6.4) and (b) strategies for overcoming the challenges. Students benefit from working through difficult passages as a class; during such lessons, students discuss—in groups and as a class—the process of making sense of challenging passages and the strategies that help.

Table 6.3 Comprehension Monitoring Strategies Used by Skilled Readers (from Grabe & Stoller, 2018)

- Having a reason for reading and being aware of it
- Recognizing text structure
- Identifying important and main-idea information
- Relating text to background knowledge
- Recognizing the relevance of the text to reading goal(s)
- Recognizing and attending to reading difficulties
- Reading carefully
- Re-reading as appropriate
- Clarifying misunderstandings

Table 6.4 Possible Sources of Text Difficulty[a]

- Absence of concrete examples
- Abstract imagery
- Abstract theorizing
- Assumed background knowledge
- Conceptual complexity
- Confusing formatting
- Figurative language
- Grammatical complexity
- Lack of clarity in writing
- Lengthy sentences
- Multiple levels of meaning
- Poorly signalled organization
- Text density
- Text length
- Unfamiliar content
- Unknown vocabulary or new meanings

[a] See Munger and Murray (2014) for other indicators of text complexity.

6.3 Instructional-Design Principles Translated into Practice

In Chapter 5, we introduced six *instructional-design principles*. Here we present a sampling of instructional practices that are aligned with each principle, centered on the teaching rather than testing of main-idea comprehension, a pre–during–post lesson framework, selection and adaptation of texts, digital literacy, reading–writing connections, and assessments *for* learning as a means to promote continuous learning.

6.3.1 Teach (Rather Than Test) Main-Idea Comprehension

Main-idea comprehension should be at the heart of reading instruction. What happens most often in reading lessons is that teachers *assess* comprehension (through post-reading questions) rather than *teach* comprehension (N. J. Anderson, 2014). Post-reading comprehension questions offer good instructional opportunities if, as suggested in Section 6.1.3, teachers invite students to follow up initial responses with explanations about (a) *why* an answer is appropriate,[6] (b) *where* the text supports their answers, or (c) *how* to understand the text better. To promote text comprehension, Fisher and Frey (2015) and Staehr Fenner and Snyder (2017) suggest that teachers ask text-dependent questions (TDQs), that is, questions that cannot be answered without having read the text. Other techniques for promoting main-idea comprehension are now explained.

6.3.1.1 Focus Instruction on the Identification of Main Ideas and the Strategies Needed to Do So

Overall, main-idea comprehension can be promoted by means of consistently orchestrated pair, group, and whole-class conversations about the texts that students are reading. Students can be asked to examine the texts that they are reading to identify if and where main ideas are stated as well as the lexical signals that help identify these places (see Appendix 5-A). When working individually, in pairs, or in groups, students can be asked to note the ways information connects across parts of the text, creates linkages between two or more readings, and builds upon student background knowledge. Main-idea comprehension can also be developed from instruction that emphasizes discourse structure awareness particularly through the use of graphic organizers (Section 6.2.2).

Asking students to summarize (individually, in pairs, or in groups) what they have read, or some segment of a longer text, also provides them with helpful practice in identifying main ideas, articulating the ideas (orally or in writing), and establishing links across main ideas and supporting information. To assist students in summarizing, teachers can start out by asking students to fill in partially completed summaries, outlines, or DSGOs while consulting the text.

6.3.1.2 Use Questioning the Author (QtA) Techniques

The Questioning the Author (QtA) approach (e.g., Beck & McKeown, 2006) promotes main-idea comprehension while involving students in questioning the "invisible author." With this approach, questions not only address text comprehension and comprehension monitoring but also lead to hypotheses about author's purpose, the identification of author bias, and an exploration of the significance of the text. With this approach, "authors are seen as fallible and intentional, and readers have the right to question them" (Underwood & Pearson, 2004, p. 143). (See Model Action Research Project 9.1.3 for details about the QtA technique.)

6.3.1.3 Create and Assign Reading Guides

Students can be guided to read like skilled readers with teacher-created **reading guides.** The guides, in the form of a handout, essentially walk students through the strategies that good readers use to read independently, with the goal of achieving main-idea comprehension at a minimum. Interspersed among the tasks in the reading guide are opportunities for the consideration of relevant background knowledge, purposeful re-reading, and discussions with classmates. (See Appendix 6-C for a sample reading guide.)

6.3.2 Structure Lessons around a Pre-, During-, and Post-Reading Framework

Developing readers benefit from instructional units, spanning one or more class sessions, organized around a pre-, during-, and post-reading framework. With such an instructional framework, the teacher assumes three important roles in each stage: *guide*, *model*, and *facilitator of success* (Table 6.5).

At the *pre-reading* stage, the teacher *guides* students in establishing a purpose for reading and setting goals. The teacher *models* strategies that skilled readers often use before reading (e.g., previewing the text, paying attention to text structure, and predicting contents) and provides opportunities for practice. Also during pre-reading, the teacher *facilitates student success* by, for example, providing information needed for comprehension (e.g., key vocabulary, background information), stimulating interest, and building student confidence and motivation.

At the *during-reading* stage, typically the most neglected stage of a reading lesson, the teacher *guides* students to read like skilled readers (e.g., reading based on previously established purpose and goals). The teacher *models* and provides students with opportunities to practice strategies used by skilled readers while reading, including connecting what is read to what is known, inferencing, monitoring comprehension, and taking steps to repair faulty comprehension. The teacher *facilitates student success* by creating reading guides (Section 6.3.1.3), making

Table 6.5 Teacher Roles (as Guide, Model, and Facilitator of Success) and Common Reading Strategies Used at Pre-, During-, and Post-Reading Stages

Lesson Stage	*Teacher Roles and Stage-Specific Reading Strategies*

Pre-reading	• Guide students in
	  ○ establishing a purpose and goal(s) for reading
	  ○ connecting text to background knowledge
	• Model and create opportunities for students to practice other strategies appropriate for this stage of reading, including
	  ○ previewing
	  ○ predicting
	  ○ posing questions
	  ○ identifying main ideas
	  ○ paying attention to text structure
	  ○ creating mental images
	• Set students up for success by
	  ○ providing information needed for comprehension (e.g., vocabulary, background information)
	  ○ stimulating interest
	  ○ building student confidence and motivation

During-reading	• Guide students in
	  ○ reading according to previously established purpose and goals
	• Model and create opportunities for students to practice strategies appropriate for this stage of reading including
	  ○ confirming, rejecting, or modifying predictions made during the pre-reading stage
	  ○ taking notes, underlining, highlighting, writing margin notes
	  ○ inferencing, guessing meaning from context (where possible)
	  ○ constructing meaning, monitoring comprehension, and taking steps to repair faulty comprehension
	  ○ connecting what is read to what is known
	• Set students up for success by
	  ○ providing "tools" for comprehending the text (e.g., discourse structure graphic organizers or outlines that students fill in, reading guides)
	  ○ supporting ongoing summarization
	  ○ helping students untangle particularly complex sentences or paragraphs

Post-reading	• Guide students in
	  ○ re-reading to check comprehension
	  ○ exploring how text organization supports comprehension
	• Model and create opportunities for students to practice strategies appropriate for this stage of reading including
	  ○ re-reading for well-established purposes
	  ○ summarizing, synthesizing, evaluating, elaborating, integrating, extending, and applying text information
	  ○ critiquing the author and aspects of the text (e.g., writing, content)
	  ○ using text information (including notes, underlining, and highlighting completed while reading) for other purposes
	• Set students up for success by
	  ○ asking them to reflect on what has been learned
	  ○ asking them to assess the value of strategies used to achieve comprehension
	  ○ asking them to judge how well objectives have been met

DSGOs available for students to fill in while reading (Section 6.2.2), supporting ongoing summarization tasks, and helping students make sense of challenging segments of a passage (Section 6.2.4).

At the *post-reading* stage, the teacher *guides* students in re-reading to check comprehension and explore how text organization supports comprehension. The teacher *models* and provides opportunities for practice of strategies used by skilled readers at the post-reading stage. Such strategies include summarizing, synthesizing (if students have read more than one text on the topic), applying text information to other tasks, and critiquing the author. The teacher *facilitates student success* by asking students to reflect on what they have learned from the text, what strategies they used to achieve comprehension, and how well they met their original goals (established during the pre-reading stage). (See Model Action Research Projects 9.1.4 and 9.1.5, focused on during- and post-reading lesson stages, respectively.)

6.3.3 Select and Adapt Texts Judiciously

The selection and adaptation of texts (textbooks, teacher-created course packs, and supplementary passages) represent critical aspects of effective reading instruction. Many teachers work in settings where textbooks are chosen for them. In such settings, the teacher can adapt textbook materials (and possibly bring in supplementary texts) to provide students with a more complete reading skill development experience. Other teachers, often in collaboration with colleagues, are given the opportunity to select their own textbooks or supplementary materials. Whatever the circumstances are, Hedgcock and Ferris (2018) capture the importance of text selection:

> We regard careful, thoughtful text selection as *absolutely essential* to successful reading instruction and experiences. … This principle includes texts that a class as a whole will study together in intensive reading lessons [and] self-selected materials for extensive reading.
>
> (p. 104, italics in the original)

Hedgcock and Ferris recommend that teachers consider numerous features when selecting texts for instruction: text length, visual information and comprehension aids (e.g., glosses, illustrations, subheadings), vocabulary, syntactic complexity, readability (linguistic and textual), discourse organization, and text difficulty. It is also important to consider students' background knowledge and contextual factors that might deem particular topics acceptable or unacceptable. Teachers should also think about adopting or adapting texts that lend themselves naturally to reading for different purposes, including reading (or re-reading) to distinguish between main ideas and details, draw inferences, respond critically, evaluate, or connect to other texts, among other purposes for reading. For academically oriented students, teachers should assign

informational texts (i.e., nonfiction texts with factual information, unlike narratives or stories), which students will encounter in academic settings. (See Duke & Martin, 2019, and Taboada Barber, 2016, for best practices using informational texts.)

6.3.4 Address Students' Digital-Literacy Needs

Today's L2 students benefit from reading print as well as digital texts, the latter accompanied by digital-literacy training (Dobler, 2015; Zawilinski, Forzani, Timbrell, & Leu, 2019; Zhang & Duke, 2008). Digital reading has created new contexts for reading and a wide range of new text types (Baron, 2017; Cho & Afflerbach, 2017). These new contexts and text types have led to the need for additional sets of reading skills and strategies (see Table 5.3). In digital contexts, especially those with reading-to-learn expectations, successful readers typically navigate multiple websites while using the most appropriate keywords and descriptors to guide their online searches. Successful digital readers intentionally suppress the distractions inherent in digital reading, stay focused on their reading goals, and strive to find information to achieve those goals. Successful digital readers also use critical reading skills to recognize biased or (un)reliable online information (Coiro, 2015).

Quote 6.9

> We need to ask ourselves how [students'] digital mind-set is reshaping students' (and our own) understanding of what it means to read. Since online technology is tailor-made for searching for information rather than analyzing complex ideas, will the meaning of "reading" become "finding information" rather than "contemplating and understanding"?
>
> Baron (2017, p. 15)

These same online readers must keep track of the array of digital materials accessed while in the midst of moving from one website to another, even when using online enhancements that permit bookmarking and highlighting. Effective digital readers work hard to recall where relevant information is located and then backtrack to find it—not necessarily a straightforward endeavor. Finally, they find ways to evaluate and integrate multiple sets of information that are not in clear view at the same time (as they might be with multiple books or photocopies of readings spread out on a desk).

Although few L2 textbooks (currently) address digital literacy skills, it behooves us to incorporate them into our instruction. Next we list some teaching tips. For additional ideas, see Dobler and Eagleton (2015) and Watts Taffe and Bauer (2013). (See Model Action Research Project 9.1.6 for an outline of challenges associated with academic digital literacy.)

6.3.4.1 Start with the Basics of Digital Literacy

It is important to start with simple, controlled tasks that introduce key vocabulary related to Web searches and essential features of URLs (Tasks 1 and 2). Tasks 3–4 take students further and are particularly useful when connected to textbook themes. For more details on these tasks, see Stoller, Grabe, and Kashmar Wolf (in press).

Task 1: Introduce students to key terminology that will assist them in interpreting and discussing Web information. Teach students the three essential elements of a Web search entry: title, URL/Web address, and descriptor (Figure 6.9).

Task 2: Ask students to look more closely at URLs to learn and interpret domain names (and country codes). Common domain names include **.com** (commercial site), **.gov** (government or government agency site), **.edu** (education site), and **.org** (organization site).

Task 3: Engage students in a task comprising a manageable set of website entries that complement a textbook theme (e.g., robots). Include questions such as the following (Stoller et al., in press):

1. Which Web search entry leads to a government website? Identify the information that influenced your decision.
   ___ Title
   ___ URL
   ___ Descriptor
   ___ Familiarity with the website
2. Which Web search entry leads to a local story?
3. Which Web search entry leads to an advertisement that may try to sell you something?
4. Which Web search entry leads to a YouTube video about the topic?
5. Which Web search entry comes from Vietnam?

Task 4: Create an activity centered on two websites that are relevant to a question being asked (e.g., about a textbook theme) but that report different answers. With this type of task, students learn to question information that they read online for reliability, accuracy, bias, point of view, authorship, or source.

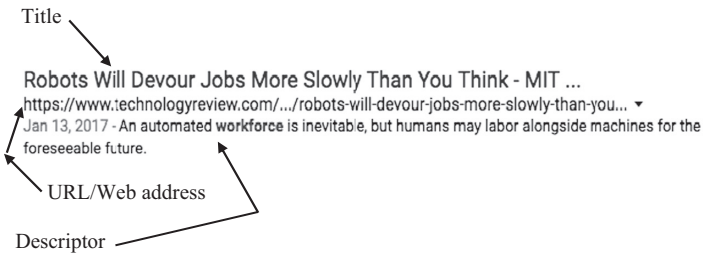


Figure 6.9 Essential elements of a Web search entry.

6.3.4.2 *Guide Students in Using Appropriate Strategies for Managing Digital Reading*

Students can be guided in using appropriate strategies for managing browsers, search engines, and keyword searches. These strategies are especially important for novices to digital reading for academic purposes because those readers typically just click the first source listed (often an ad) without scrutinizing it and then work their way down search engine results (Zawilinski, Forzani, Timbrell, & Leu, 2019). Students can also be guided in (a) maintaining goals for reading and staying on task and (b) making use of digital enhancements (Goss, Castek, & Manderino, 2016), which include glossaries, online dictionaries, bookmarking, and highlighting.

6.3.4.3 *Build upon Course Textbooks with Related Web-Based Informational Texts*

Even though few ready-made digital-literacy teaching materials are available to language teachers, the Web is at our fingertips. We can integrate digital-literacy instruction into our teaching most easily by building upon textbook units with related informational texts from the Web. For example, if our textbook has one or more passages on robots (Savage, 2017), we can integrate level-appropriate texts from the Web on the topic into instruction. When we do so, we can (a) build upon students' knowledge of the topic, (b) recycle key thematic vocabulary, (c) explicitly address digital literacy skills and strategies, and (d) assign academic tasks that require students to make use of information learned from multiple sources (as they will have to do on their own when moving beyond our language classes).

6.3.5 *Connect Reading to Writing*

In academic settings, students are typically required to read to learn and read to write, the latter requiring reading–writing integration. Teachers of reading should integrate reading and writing whenever possible to prepare students for reading-to-write tasks (Brenner, 2014; Ferris, 2015; Hirvela, 2016). As part of reading-to-write instruction, teachers should address explicitly the writing skills (and vocabulary) required for effective paraphrasing and issues related to plagiarism and attribution (Cushing Weigle, 2014).

Quote 6.10

> The most effective literacy teachers are those who teach processes of reading and writing, separately and together, in ways that meet individual students' needs and move entire classes of students to greater achievement.
>
> Brenner (2014, p. 56)

6.3.5.1 Assign Reading-Based Writing Tasks

Teachers can prepare students for reading-to-write tasks by assigning text-based tasks (Table 6.6). With text-responsible writing, students are held accountable for information in the texts that they are reading. The use of informational texts (mentioned earlier) lends itself to reading–writing tasks.

6.3.5.2 Introduce Students to Varied Genres

When making a commitment to reading-to-write instruction, teachers introduce students to varied genres, using texts as models for students' subsequent writing. When introducing students to new genres, teachers can adopt a *read–notice* approach, followed by a *read-analyze and write* approach (Stoller & Robinson, 2015, 2018). In the former pre-writing approach, students develop observational skills that help them notice, compare, and contrast writing conventions in different genres, thereby preparing students for the subsequent *read-analyze and write* approach. With both approaches, teachers bring to students' conscious attention the characteristics of new genres (e.g., organization, rhetorical patterns, vocabulary choice, and genre-specific writing conventions) that will assist them in reading and writing. Like reading-skills development, which requires a lot of practice, students' reading-to-write abilities require teacher scaffolding and plentiful opportunities for practice and teacher feedback.

6.3.6 *Assess for Learning*

Reading assessment can be viewed from two perspectives: assessment *of* and *for* learning, the latter often referred to formative assessment or learning-oriented assessment (Turner & Purpura, 2016). As explained in Chapter 5, assessment *of* learning aims to determine how well students have learned (or are learning) the skills, sub-skills, and content taught (and practiced). Assessment *for* learning, on the other hand, comprises activities that support learning (Turner & Purpura, 2016).

Table 6.6 Reading-Based Writing Tasks

- Taking notes while reading or filling in an outline (prepared by the teacher) while reading
- Summarizing main ideas in a text
- Summarizing and then critiquing a text
- Paraphrasing complex sentences that are important for main-idea comprehension
- Answering short answer or essay questions about one or more texts
- Synthesizing information from two or more texts
- Comparing viewpoints introduced in one or more texts and producing a critical synthesis
- Researching further a topic introduced in the textbook and writing a "research paper" or literature review

Adapted from Grabe & Zhang, 2013.

Assessment *for* learning measures students' incremental improvements, assumes teacher feedback—what Carless (2007) refers to as "feedforward" or "forward-looking" feedback (pp. 59, 60)—and encourages student reflection on their own learning. Assessment *for* learning should take place during every class session, as teachers observe and provide forward-looking feedback on student engagement, motivation, and class performance on reading-related tasks in pre-, during-, and post-reading class segments. For learning-oriented assessment to be effective, students must have opportunities to engage actively with the feedback provided (Wiliam, 2011).

Quote 6.11

> [A critical feature of learning-oriented assessment] is the role of feedback in helping to close learning gaps. Feedback has many purposes. It can help learners develop an awareness of some aspect of the target learning point, sort out differences between new information and prior knowledge, remember new information, understand learning goals, and compare current performance with expected criteria for success.
>
> Turner and Purpura (2016, p. 266)

6.3.6.1 Use Formal and Informal Reading-Assessment Formats

Both assessments *of* and *for* learning can be carried out through formal testing formats (e.g., cloze passages, fill in the blank, matching, multiple choice, sentence completion, short written responses, summaries, true–false questions). They can also be carried out through informal measures, such as teacher observations of students' in-class performance, student records of reading engagement (number of pages or books read, simple book reports, rate charts), student portfolios of reading activities, and teacher–student conferences (to discuss, e.g., students' reading progress, goals, interests, reading choices, and strategy use).

6.3.6.2 Modify Teaching Practices to Create Learning Opportunities

Assessment *for* learning plays an important role in reading instruction. A combination of formal and informal assessments (noted earlier) and modified teaching practices allow for (a) teacher feedback, (b) student discussions and reflections on their own performances, and (c) opportunities for students to signal when they need help (Wiliam & Leahy, 2015) and to act upon feedback provided (Carless, 2007; Turner & Purpura, 2016).

Teachers can *modify* their teaching of reading in, at a minimum, the following ways to create opportunities for assessments *for* learning:

- Ensure students understand learning goals and criteria for success.
- Provide timely forward-thinking feedback on a consistent basis.
- Wait three to five seconds after asking a question without answering the question when students are silent and without calling on stronger students for answers.
- Move from more traditional question-and-answer sequences about reading passages to questions that initiate a discussion with and among students about their understanding of the text.
- Handle wrong answers and performance difficulties in ways that engage students in finding good answers and achieving task success.
- Engage students in pair, group, and whole-class discussions about reading tasks.
- Ask *why*, *where*, and *how* questions to generate discussions about answers to comprehension questions (Section 6.1.2).
- Encourage students to self-regulate by making use of feedback provided and taking responsibility for their own learning and reading improvement.

6.4 Conclusion

Space does not permit a full accounting of ideas for effective L2 reading instruction. Nonetheless, this chapter describes important foundational practices that can and should be incorporated into instruction centered on reading-skills development. The instructional practices introduced here can be integrated, with or without adaptation, into reading classes of many types, with students at all levels of reading proficiency.

Overall, a single chapter on teaching reading, paired with a chapter on reading curriculum principles (Chapter 5), can only begin to identify the potential instructional options and variations that could make a difference in L2 students' reading success. The key to these ongoing efforts is to continue exploring effective practices for reading instruction. The chapters that follow (Chapters 7–9) describe model action research projects that teachers can use as springboards to investigate aspects of their own teaching of reading.

Appendix 6-A: Student Worksheet: Discourse Structure Graphic Organizers (Created for "Looking into the Eyes of a Robot," Savage [2017]; See Appendix 6-B for Answer Key)

1. Re-read paragraph 2. Define "uncanny valley."

Uncanny valley	is	a person's negative _____ to _____	that	look like _____.

2. Re-read paragraphs 4 and 5. Identify the causes of "uncanny valley" feelings and their effects.

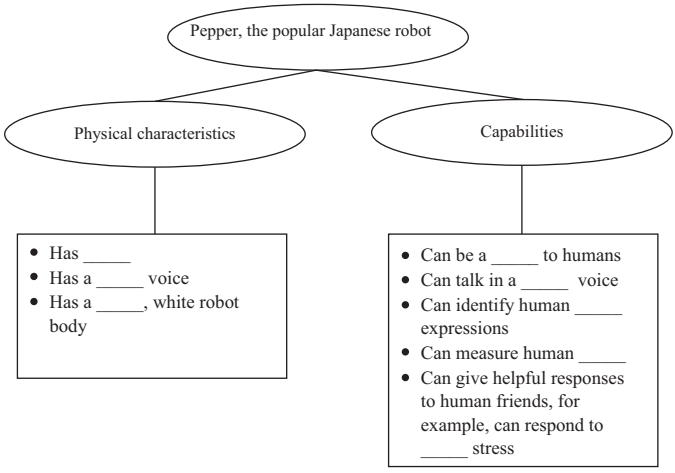
Cause	Effect
Robots look human-like. They a. have hair and _____ b. express emotions, such as _____, anger, and _____ c. can speak d. can answer _____ e. have _____conversations	People feel _____ around human-like robots. a. uncomfortable b. _____ c. disgust d. worried e. _____

Cause	Effect
Robots look human-like, but not _____ human.	To people, these robots appear _____. a. creepy b. _____ c. unpredictable d. _____ e. dead

3. Re-read paragraph 6 for the basic solution to the problem with human-like robots.

Problem	Solution
People react negatively to human-like robots.	Robots have to_____ and _____ like machines.

4. Re-read paragraph 9. Describe Pepper, the popular Japanese robot.



Appendix 6-B: Answer Key to DSGO in Appendix 6-A

1. Re-read paragraph 2. Define "uncanny valley."

Uncanny valley	is	a person's negative **response** to **machines**	that	look like **humans**.

2. Re-read paragraphs 4 and 5. Identify the causes of "uncanny valley" feelings and their effects.

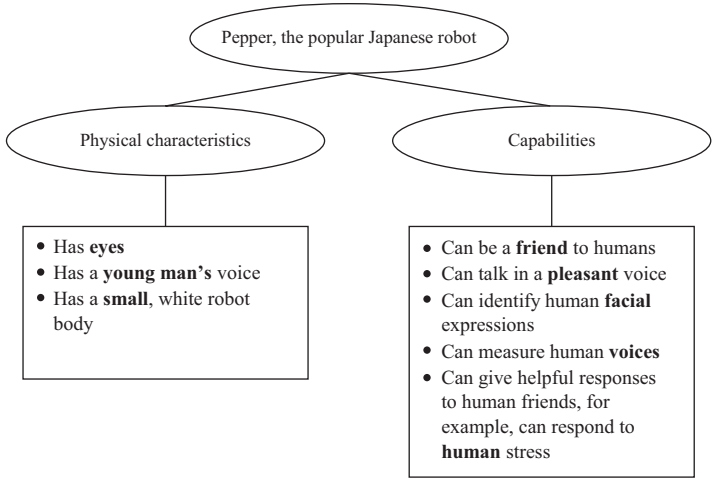
Cause	Effect
Robots look human-like. They a. have hair and **skin** b. express emotions, such as **happiness**, anger, and **sadness** c. can speak d. can answer **questions** e. have **simple** conversations	People feel _____ around human-like robots. a. uncomfortable b. **afraid** c. disgust d. worried e. **nervous**

Cause	Effect
Robots look human-like, but not **completely** human.	To people, these robots appear a. creepy b. **sick** c. unpredictable d. **dangerous** e. dead

3. Re-read paragraph 6 for the basic solution to the problem with human-like robots.

Problem	Solution
People react negatively to human-like robots.	Robots have to **look** and **act** like machines.

4. Re-read paragraph 9. Describe Pepper, the popular Japanese robot.



Appendix 6-C: Sample Reading Guide

(developed for advanced EFL learners, to accompany the reading of "Welcome to the Drone Age," adapted from *The Economist*, 9/26/15)

1. Based on the illustration and title, what do you think the article will be about? Make three predictions.

   a.
   b.
   c.

2. Re-read the title. Then read the supertitle, subtitle, and paragraph 1.
3. Turn to a partner and discuss your predictions; modify predictions, if needed.
4. Re-read paragraph 1. Fill in the timeline as you read.
   1980_____
   2010 (2020)_____
   2015_____
5. Make two predictions about the rest of the article.

   a.
   b.

6. Skim the rest of article. Then turn to your partner and list two main ideas of this passage.

   a.
   b.

7. Re-read paragraph 2 about the many *commercial uses* of drones. While reading, fill in the top section (paragraph 2) of the graphic organizer.
8. Re-read paragraphs 3 and 4. Fill in the rest of the graphic organizer.
9. Re-read the full passage. Underline the single sentence that best captures the main idea of *each* paragraph.

Parag.	*Practical Uses*		*Details*
2	Commercial	1. Agriculture	1a. Monitor crop growth 1b._____ 1c._____
		2._____	
		3. Filmmaking	3._____
		4.	
		5._____	5a._____ 5b. Amazon, UPS, and _____
		6. Parcel delivery	

Parag.	*Practical Uses*		*Details*
3	_____	1. Geographers	1a. Track erosion 1b. _____ 1c. Inspect glaciers
		2. _____& historians	2a. _____ 2b. Map ancient ruins and earthworks
		3. _____	3a. Enter active volcanoes 3b. _____
		4. Marine scientists	4. _____
		5. Ornithologists	5a. Study birds 5b. _____
4	Public Service	1. in Ottawa	1. _____
		2. in _____	2. Map accident scenes so that roads can be opened more quickly
		3. in Maine	3. _____

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. These additional citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Concept-Oriented Reading Instruction (CORI)*, see www.cori.umd.edu
- *Digital literacy*, see Goldman, Braasch, Wiley, Graesser, and Brodowinska (2012).
- *Independent reading*, see Moss and Young (2010).
- *Motivation*, see Dörnyei and Ushioda (2011).
- *Purposeful reading*, see Britt, Rouet, and Durik (2018).
- *Reading comprehension with complex texts*, see Cummins (2015), Fisher, Frey, and Lapp (2012, 2016), Lapp, DeVere Wolsey, Wood, and Johnson (2015), and L. Robb (2013).
- *Reading informational texts*, see Cummins (2013), Moss and Loh-Hagan (2016).
- *Reading strategies*, see Almasi and Fullerton (2012).
- *Reading teacher resources*, see Peregoy and Boyle (2016), Mikulecky (2011); see also http://www.readwritethink.org/index.asp; http://www.literacytrust.org.uk/; http://www.literacy.org/.
- *Vocabulary*, see Crosson (2016), Graves (2009, 2016), Nation (2008, 2013), and Zimmerman (2009).

Notes

1 See Chapter 5, Further Reading, for links to the Extensive Reading Foundation website.
2 Sustained Silent Reading (**SSR**)—also referred to as Drop Everything and Read (DEAR), Super Quiet Reading Time (SQUIRT), Uninterrupted Sustained Silent Reading (USSR), Daily Independent Reading Time (DIRT), voluntary reading, and independent reading—promotes independent, silent reading time, with no teacher interventions, interruptions, guided instruction, or evaluation. SSR practices, which have come under critical scrutiny in recent years (Miller & Moss, 2013; Reutzel, Jones, Fawson, & Smith, 2008; Reutzel, Jones, & Newman, 2010), are being substituted by Scaffolded Silent Reading in many settings.
3 Compare the concept-of-definition map with a Frayer Organizer, which guides students in identifying the attributes of a given concept in a similar, though distinct, manner (see Lapp, DeVere Wolsey, Wood, & Johnson, 2015).
4 Folse (2004) refers to such exercises as "timed word selection exercises."
5 Pronunciation should not be considered a key issue for repeated reading unless words are pronounced so poorly that they could be totally different words. Repeated reading tasks should not be confused with pronunciation practice.
6 See also Ozgungor and Guthrie, 2004; Pressley, 2006, for a discussion of the Elaborative Interrogation Approach, a "gentler" approach to main-idea comprehension than its label might suggest. The approach centers on follow-up *why* questions that oblige students to return to the text, re-read, and then explain their answers. When done well, student responses generate class discussion, and students learn to defend their answers and explain the strategies they used to decide on an answer.

Part IV

Investigating Reading through Action Research

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7 Reading Teachers as Action Researchers

This chapter provides a rationale for teacher-initiated inquiry and introduces a flexible eight-step framework for conducting action research in classrooms with reading skills development aims. Of particular interest are the following:

- A general introduction to action research that highlights its value and versatility.
- A sampling of general reading-related topics that can be explored through action research.
- An easy-to-consult description of the eight-step action research process.
- Two sample action research projects that illustrate the eight-step process.

Those of us who are responsible for teaching reading work in a variety of instructional settings. As diverse as our classroom settings may be, what we have in common is the desire to guide students toward becoming more skilled, motivated, fluent, and strategic readers. To be effective reading teachers, it behooves us to move beyond superficial theories of reading, instructional fads, and intuitions based on, for instance, our own experiences learning to read (as if one can really remember). As reading teachers, we benefit from a current understanding of reading—based on theory (as explained in Chapters 1–2), research (Chapters 3–4), and practice (Chapters 5–6). Such foundational knowledge provides us with the tools to do the following:

1. Determine students' reading needs.
2. Adjust curricular priorities to meet students' reading-related needs.
3. Articulate relevant instructional goals and objectives.
4. Design (and redesign) courses.
5. Plan purposeful reading lessons.
6. Adopt, adapt, and develop instructional materials and assessment tools.
7. Provide meaningful (and forward-looking) feedback to students on various aspects of reading.
8. Adjust daily lessons in response to students' immediate needs, responses, and attitudes.

To fulfill these varied responsibilities, we can build our understanding of reading in a number of additional ways. We can read the professional literature, participate in professional-development seminars, attend conference sessions on reading-related topics, and enroll in advanced degree programs. We can *also* use our own classrooms, often neglected resources, as windows to a deeper understanding of reading. By means of systematic reflection on aspects of our reading instruction and our own students' reading-skills development, we can gain a keener understanding of reading, fine-tune our use of instructional techniques that help students develop reading skills, supplement our textbooks to meet students' reading-development needs, and build teacher–student relationships that support effective learning.

The term **action research** (or teacher-initiated inquiry) is often used to describe this type of teacher activity (Burns & Edwards, 2014; Mills, 2018). Through action research, teachers look critically at their own classrooms to improve their teaching and enhance the quality of students' learning. Action research helps teachers develop professionally through the systematic collection and analysis of data from their own classrooms and then the use of findings to enhance the teaching and learning that take place there.

Quote 7.1

> Action research is decidedly not a fad for one simple reason: G*ood teachers have always systematically looked at the effects of their teaching on student learning*. They may not have called this practice action research, and they may not have thought their reflection was formal enough to be labeled research, but action research it was!
>
> Mills (2018, p. 22, italics in original)

Action research provides teachers with non-threatening means for reflecting on reading from a variety of perspectives. Through action research, we can investigate almost any aspect of reading instruction (or assessment) that we want to understand better or improve. (See Concept 7.1 for a sampling of reading-related action research options.) The real appeal of action research is that it permits us to examine reading in practical terms and explore realistic alternatives to reading instruction in our own classrooms, with our own students, and at our own pace. Final outcomes result in not only an enhanced understanding of reading but also improved instruction and more proficient student readers.

Concept 7.1: Purposes for Reading-Related Action Research

By means of action research, teachers can …

- Examine *instructional practices* that appear to work well and determine why they work well.

For example, the teacher may want to determine why graphic organizers or in-class time devoted to extensive reading work so well.

- Analyze *teaching techniques* that do not work as effectively as expected, so those techniques can be remedied rather than discarded.

For example, the teacher may be having difficulties with jigsaw reading tasks and want to determine the sources of those difficulties.

- Evaluate the *impact of instructional techniques* to determine what works best for reading-skills development.

For example, the teacher may focus on paired oral re-reading, strategic-reader training, or Readers Theater to determine the extent to which it helps students' reading-skills development in areas such as reading fluency, main idea comprehension, and reading strategy use.

- Check the *appropriateness of reading passages*.

For example, the teacher can look over textbook passages for elements that might prove challenging for students, such as abstract concepts, assumed background knowledge, cultural assumptions, grammatical complexity, length, text density, or vocabulary.

- Evaluate *student responsiveness* to a range of text types, genres, and topics.

For example, the teacher might want to determine how students respond to descriptive or narrative passages, poetry, biographies, online texts, or informational texts about the environment, current events, animals, students' own countries and cultures, or famous people.

- Assess the *benefits derived by students* when reading for different purposes.

For example, the teacher might assess the benefits derived by students when reading or re-reading to (a) search for simple information, (b) learn new information, (c) synthesize information from more than one source, or (d) write.

- Determine the *advantages* of extensive reading.

For example, the teacher may examine (a) the impact of extensive reading on student attitudes toward reading or (b) students' responsiveness to online MReader quizzes and reading tracking systems, hosted by the Extensive Reading Foundation (https://mreader.org/info/).

- Evaluate *alternative means of achieving instructional goals*.

For example, the teacher, whose class has reading fluency goals, may experiment with shadow reading, paced reading, reading aloud with taped versions of texts, paired oral re-reading, or computer pacing.

- Review the *reading curriculum* and its digital literacy goals

For example, a team of teachers may review curriculum documentation and interview teachers to determine if, how, and in which levels of instruction digital literacy is addressed.

- Experiment with *different forms of reading assessment*

For example, a team of teachers may try out different forms of learning-oriented assessment, that is, assessment *for* learning, with the goal of mastering how to give forward-looking feedback and engage students in responding to that feedback in proactive ways.

Quote 7.2

> Action research is seen by its advocates as a means of empowering teachers and enabling them to acquire deeper insights and understanding about their practices. At the heart of these claims is the notion of educational change and innovation occurring through a systematic approach that integrates classroom action, research and reflection.
>
> Burns and Edwards (2014, p. 65)

7.1 Teachers Investigating Their Own Classrooms: "How To" Guidelines

The benefits of action research suggest that such inquiry should become a routine part of teachers' professional lives (Coombe & Barlow, 2007; Smith, Connelly, & Rebolledo, 2014). Despite the fact that our options for action research are virtually limitless, the steps that we take to investigate our own classrooms typically follow a basic progression, though in an iterative and cyclic fashion (see Figure 7.1). What is particularly appealing about the process is that there is always room for simplicity, flexibility, and practicality (Farrell, 2007; Richards & Farrell, 2005). And the potential usefulness of action research, for teachers—and by extension their students—is ever present.

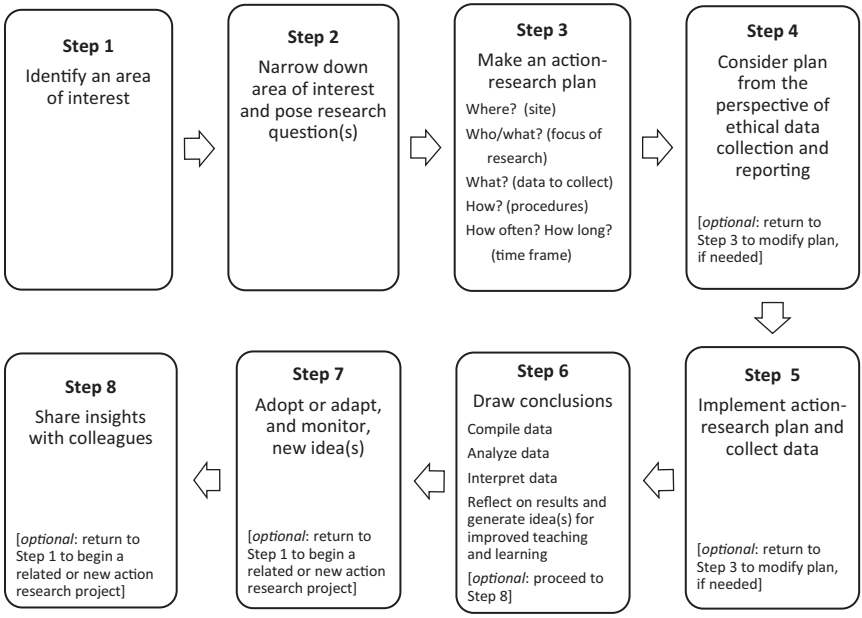


Figure 7.1 Eight-step action research process.

Quote 7.3

> Teacher-initiated research … helps practitioners to explore the teaching and learning processes taking place in their own classrooms with a view to their making more informed pedagogical decisions.
>
> Smith, Connelly, and Rebolledo (2014, p. 115)

The eight steps proposed in our action research model (a rethinking of our 12-step model in Grabe & Stoller, 2002, 2011) are flexible and can be adapted by the busiest of teachers. They also can be easily used by novice and experienced teachers, teachers with small or large classes, and teachers in both free and restrictive settings. In a simple but meaningful action research project, teachers can observe themselves for one or two days (or one to two weeks) to see, for example, how they respond to students' questions about new vocabulary or how they build upon post-reading questions at the end of textbook chapters to meet reading-lesson objectives. Or teachers can devote every other Monday to a reading rate development routine that they want to understand better. Or they can follow the progress of one student during a few weeks (or a month or a semester) of instruction to determine how one type of student (e.g., a motivated student, unmotivated student, fast reader, slow reader) responds to a particular teaching

technique, group activity, or reading task. Because we are in control of our action research, we can design it to meet our own needs and conform to our own time constraints.

Although our action research model is depicted as a simple flowchart (Figure 7.1), in reality action research is an iterative process, and the teacher has the option to return to earlier steps to make adjustments when needed. In an effective action research project, a dynamic relationship exists between the research question, posed by the teacher in the early stages of the process, and the ways the project proceeds. Action research gives the teacher the flexibility (and authority) to reconsider guiding questions, data-collection techniques, and methods of analysis. The bottom line is that a lifetime of manageable action research projects contributes to an enhanced understanding of reading, improved teaching and learning, and a better understanding of ourselves. (See Burns, 2013, 2015, for a discussion of action research phases.)

Quote 7.4

> [Action research offers] a practicable and non-threatening institutional pathway into viewing research as a major contributor to enhancing quality in ELT [English Language Teaching] education.
>
> Burns (2013, p. 92)

In the chapter sections that follow, each part of the eight-step process is introduced with general comments that highlight the major goals of the step. More specific details emerge in our description of two distinct (and realistic) reading-related action research projects. These two sample projects—one exploring vocabulary instruction in a reading class and the other exploring amount of in-class silent reading that students engage in—gradually unfold, like a story, as we move from step to step. (For the purposes of this illustration, we proceed forward, from step to step, instead of highlighting the iterative nature of action research projects that occur in real life.) We hope that the two examples, written in first person to demonstrate their real-world applicability, illustrate how manageable and worthwhile the action research process can be. It should be noted that these two model action research projects, as well as the sample action research projects that follow in Chapters 8 and 9, can and should be modified to complement the concerns and interests of teachers in their own teaching contexts.

7.1.1 Identify an Area of Interest (Step 1)

When we identify some aspect of our reading instruction or our students' reading development that we would like to understand better or improve, we are, in essence, establishing a *purpose* for our research and identifying *an area of interest*. Our purpose and area of interest can be a direct response to our very own classroom experiences or be traced back to something that we have read in the

professional literature, heard in a professional-development seminar, or observed in someone else's class. Consider the following real-world examples.

Vocabulary Action Research Project: Step 1

Purpose: I want to understand the extent to which I am teaching vocabulary explicitly. There is a lot of evidence that direct vocabulary instruction can assist L2 students in developing their vocabulary and, in turn, help them become better readers. The importance of explicit vocabulary instruction has been reinforced repeatedly in the professional literature (e.g., Graves, 2016; Nation, 2013; Webb & Nation, 2017; Zimmerman, 2009) and by my students' persistent requests for more vocabulary.
Area of Interest: Explicit instructional techniques for vocabulary expansion

Amount-of-Reading Action Research Project: Step 1

Purpose: It should come as no surprise that students really learn to read only by reading and by reading a lot (Grabe, 2009), yet the amount of time that students actually spend reading silently in the typical classroom is limited, sometimes only a few minutes per day (e.g., Duke, 2000). Although I spend a lot of class time on reading-related activities, I don't think that my students engage in enough silent reading (Hiebert & Reutzel, 2010). I want to determine the amount of *silent reading* that goes on in my class. Then I can decide if I should restructure my lessons to incorporate more silent-reading time, either in the form of Scaffolded Silent Reading (Reutzel, Jones, & Newman, 2010) or engaged silent reading (Swan, Coddington, & Guthrie, 2010). I could also easily follow up this action research project with a second one to investigate how much time my students spend reading out of class to get a more accurate snapshot of their actual daily and weekly reading time. But I'll start small, paying attention for now to silent reading time in class.
Area of interest: Amount of in-class silent reading

7.1.2 Narrow Down Area of Interest and Pose Research Question(s) (Step 2)

To craft a manageable action research project, we must limit the focus of our inquiry. To get started, we generally brainstorm possible research questions related to our area of interest. We can do so on our own, with colleagues who have similar interests or concerns, and also with our students. Then, in an effort to narrow the scope of the project, we select one (or a limited number) of our questions to guide our research. The research questions that we set aside, in addition to those that are likely to emerge during the action research itself, can serve as stimuli for future research.

Consider the process of narrowing the scope of action research by examining our two sample action research projects.

Vocabulary Action Research Project: Step 2

Area of interest: Explicit instructional techniques for vocabulary expansion

Possible questions related to area of interest include the following:

1. What instructional approaches do I use to assist students in learning new vocabulary?
2. How often do I use word-family and word-analysis activities to promote vocabulary learning?
3. To what extent might a classroom word wall (e.g., Eyraud, Giles, Koenig, & Stoller, 2000) lead to meaningful vocabulary-learning tasks?
4. In what ways might I use corpus tools for explicit vocabulary teaching?
5. Which explicit vocabulary-teaching techniques lead to better retention of vocabulary over time?
6. What works better: using explicit vocabulary-teaching techniques *before* or *after* students have encountered a new word in context?

Preferred question: What instructional approaches do I use to assist students in learning new vocabulary? (question 1)

Amount-of-Reading Action Research Project: Step 2

Area of interest: Amount of in-class silent reading.

Possible questions related to area of interest include the following:

1. How much silent reading do my students engage in during class?
2. What is the most realistic amount of time that can be devoted to silent reading in class?
3. How do students feel about the amount of in-class silent reading that they are engaged in?
4. Which reading materials (e.g. graded readers, magazines, nonfiction texts, textbook) do students typically read in class? Do they have any choices?
5. What is the difference between the amount of reading completed by strong and weak readers?
6. What can I do to motivate students to read attentively during class time devoted to silent reading?

Preferred question: How much silent reading do my students engage in during class? (question 1)

7.1.3 Make an Action Research Plan (Step 3)

After deciding on a focal point for our action research, defined by one or more research questions, we are ready to plan our action research. As part of planning, we want to answer at a minimum six questions: Where? Who/What (to focus on)? What (data to collect)? How? How often and for how long?

Where? Where will we conduct the research? In which class(es)? At which site (if we teach in more than one location)? In a computer lab, reading lab, or traditional classroom? In the teacher's workroom? At home?

Who/What (focus of research)? Who or what do we want to focus on? Ourselves? A full class of intermediate-level language learners? A subset of our students (e.g., motivated–less motivated students, weak–strong readers, slow–fluent readers, readers from languages with writing systems different from the target language)? Our mandated textbook? Available graded readers?

What (data to collect)? What type(s) of data should we collect? The guiding research question itself is likely to reveal various options, including the collection of **quantitative data** (i.e., numerical data, data that can be counted, for example, students' reading rates in minutes and seconds, comprehension scores as the number correct over total possible, test scores, number of minutes students read per day); **qualitative data** (i.e., data that cannot be counted but that can be reviewed for noticeable patterns, trends, and insights, for example, student reflection papers, teacher lesson plans, student journal entries, taped student think alouds, digital photos of the classroom word wall, an inventory of textbook pre-reading tasks); or a combination of quantitative and qualitative data (i.e., a mixed-mode approach). The key is to identify data that, when analyzed, will assist us in answering our research question(s).

How? How will we collect data? We can approach the data-collection task in many ways. We can collect data by ourselves or collaboratively with one or more teachers (Burns, 2010; Burns & Burton, 2008). We can devise data-collection procedures that complement normal classroom routines, thereby causing minimal disruption to class lessons, or we may use procedures that turn out to be somewhat intrusive because they are not part of the normal classroom routine (e.g., questionnaires administered during class time). Or we might choose approaches that do not impact classroom instruction at all by, for instance, gathering sets of documents that are relevant to the research question (e.g., lesson plans, student writing samples, Readers Theater scripts, a set of graded readers). Consider a teacher who is motivated by the desire to determine which of her students need additional work on rate development. She may want to find out how fast her students read when they are reading for general comprehension. With the assistance of a record-keeping sheet, the teacher systematically collects students' reading rates (in minutes and seconds) and comprehension scores (as number correct over total possible). These quantitative data will help the teacher answer

her action research question. Or imagine a teacher who wants to explore ways of helping students develop an appreciation for how much they have learned through reading. That teacher might ask his students to write a series of brief reflective essays in which they record the most interesting *new* information learned at the end of every week, based on a review of previously assigned readings. An analysis of the reflection papers is likely to reveal students' attitudes about the passages read, in addition to topics of particular interest to students (i.e., qualitative data), offering the teacher researcher insights into students' perceptions of their reading experiences and reading-to-learn activities. Many research questions naturally lead to the collection of both quantitative and qualitative data.

Quote 7.5

> Whether [teacher research] is conducted collaboratively or individually, … teacher research provides a way for teachers to integrate investigation, planning, teaching, and resource development into a holistic and systematic process.
>
> Burns and Burton (2008, p. 8)

Concept 7.2 lists possible data-collection techniques; they are listed separately, but we can (and often do) use more than one data-collection technique in our action research. Triangulation (i.e., the process of using more than one data-collection method) allows us to consider our research question(s) from various vantage points (Burns, 2010).

Concept 7.2: Data-Collection Techniques

Case studies: Investigation of an individual *case* (e.g., a learner, student group, teacher, class).

Classroom observations: Attentive observation, supported by some form of record keeping (e.g., note taking, audiotaping, videotaping, checklists), of aspects of one's own classroom (conducted by another person) or another teacher's classroom.

Document gathering: Collection of documents (interpreted broadly) that are relevant to the research question (e.g., in-class exams, teacher lesson plans, pre- and post-tests, student homework, student records, textbooks).

Field notes: A written record—taken in real time as the study proceeds and not afterward—of classroom events related to the research question (e.g., physical set-up of classroom, student groupings, pre-reading task progression, teacher–student interactions; compare with *Journals* and *Teaching logs*).

Focus groups: Small-group discussion, guided by the teacher researcher, on a particular topic (possibly to solve a problem, generate ideas, share opinions).

Interviews: Face-to-face interactions conducted by the teacher in a structured, semi-structured, or unstructured format with teachers, administrators, librarians, aides, and parents (compare with *Focus groups* and *Teacher–student conferences*).

Journals: Dated and written record—usually completed after class—of teacher's opinions and reactions to research-related issues (compare with *Teaching logs* and *Field notes*).

Questionnaires: A set of research-related questions (on paper or online) that the teacher asks participants (e.g., students, other teachers, administrators, librarians, parents) to answer.

Record-keeping forms: Standardized forms (e.g., charts, checklists, grids, matrices, tally sheets, worksheets) used for systematic data collection.

Self-observations: Attentive observation of a select aspect of one's own teaching, utilizing some form of record keeping (e.g., audiotaping, videotaping, record-keeping form).

Simulated recalls: Review of previously recorded data (e.g., an audiotape, videotape or transcription of a class or teacher–student conference) to prompt responses from participants on events or activities being investigated.

Surveys: (See *Questionnaires*).

Teacher–student conferences: Focused face-to-face interactions between teacher and student, often away from the rest of the class (compare with *Interviews*).

Teaching logs: Dated and written record of focal teaching events, usually completed after class and including factual information rather than subjective reactions and opinions (compare with *Journals* and *Field notes*).

Verbal reports: Verbal reflections on focus of research, often recorded on one's cell phone.

Quote 7.6

If we apply [triangulation] to data collection it means that a combination of angles on the data will help give us more objectivity. This usually means collecting more than one type of data…. Then you can compare, contrast, and cross-check to see whether what you are finding through one source is backed up by other evidence. In this way you can be more confident that your reflections and conclusions are supported by the data and not just by your own presuppositions or biases.

Burns (2010, p. 96)

How often and for how long? Although action research need not occupy a lot of time, time is required for all action research (Efron & Ravid, 2013; Farrell, 2007). When we decide to engage in action research, we must consider (and possibly calculate) the time demands of the project. In this way, before jumping into the project we have a realistic sense about what we have committed ourselves to. The time demands of action research vary, depending on the nature of the overall plan, data-collection procedures, and analysis. In some projects, we devote time *before* actually starting our research to prepare or locate appropriate materials (e.g., comprehension questions, pre- and post-tests, questionnaires, record-keeping sheets, textbook reading passages, vocabulary items). In other cases, time may be needed *after* class to reflect on classroom events (e.g., in a journal, teaching log, or on a checklist) or to transcribe a recording of a class observation. Some action research projects necessitate in-class instructional time; these types of projects usually require adjustments in our lesson plans so that data-collection activities can be accommodated. In all action research projects, time is needed to analyze data, reflect on results, and consider new ways of teaching in light of results (Step 6), and then try out new teaching ideas (Step 7). When we choose to share our insights with colleagues (Step 8), that requires time, too.

Also related to time are issues of *when*, *how often*, and *for how long* to gather data. As noted earlier, we may choose to observe ourselves during just one week of class. Or we may collect data twice a week for an entire semester or academic year. As another option, we may collect data across three textbook units. Although action research can be shortened or lengthened at any point, deciding on an initial time frame is helpful.

Consider our sample action research projects and the action research plan for each.

Vocabulary Action Research Project: Step 3

Area of interest: Explicit instructional techniques for vocabulary expansion.

Preferred question: What instructional approaches do I use to assist students in learning new vocabulary?

Action Research Plan

Where? In my intermediate-level reading–writing class.

Who/What (focus of research)? Myself (the teacher).

What (data to collect)? Inventory of explicit vocabulary instruction techniques used in class.

How? Self-observation and tally sheet to keep track of explicit vocabulary teaching techniques (Appendix 7-A).

How often and for how long? I'll set aside time after class on Tuesdays and Thursdays, during weeks 4–6 of the semester. I'll analyze my

records at the end of that period to determine if I have sufficient data to answer my guiding research question. If I don't have enough data, I'll continue my record keeping for a couple more weeks.

Amount-of-Reading Action Research Project: Step 3

Area of interest: Amount of in-class silent reading.
Preferred question: How much silent reading do my students engage in during class?

Action Research Plan

Where? In one of my English for Academic Purposes (EAP) reading classes.
Who/What (focus of research)? Full class of students enrolled in the class.
What (data to collect)? A record of time (in minutes) that students spend reading silently (when the whole class is reading silently).
How? Record-keeping sheet that is filled in during or immediately after class (e.g., Appendix 7-B). I'll use my cell phone to keep track of time.
How often and for how long? Because record keeping is so simple, I plan to keep track of students' in-class silent reading every class meeting for the first half of the semester. (I just have to get into the habit of having my cell phone out to record the time students are reading silently.)

7.1.4 Consider the Action Research Plan from the Perspective of Ethical Data Collection and Reporting (Step 4)

Before implementing our action research projects (after having made decisions about what data to collect in addition to where, from whom, how often, and for how long), it is important to take into account fundamental ethical considerations (Burns, 2010; Efron & Ravid, 2013; Mills, 2018). Whenever our action research involves human participants (as opposed to, e.g., the examination of documents like textbooks or the taping of ourselves), we want to be sure that we treat our participants (typically our own students) fairly, respectfully, and responsibly. This essentially means that our action research projects should not cause participants any risk, harm, distress, or disadvantage. Many schools, school districts, universities, and language programs have their own **Institutional Review Boards** (**IRB**s); the main function of these boards is to ensure the ethical conduct of researchers and the fair treatment of participants. Teachers engaging in action research should find out what policies and procedures govern action research activities at their institutions.

Action research projects that are intended for use beyond teacher self-improvement may require IRB approval. For instance, a teacher researcher may plan to use findings for some purpose beyond the study situation itself (e.g., a newsletter article, a conference presentation). IRB approval may be needed if data involving student responses are reported. Typically this requires informing participants about the study, asking for their volunteer participation, and soliciting their **informed consent** (i.e., participants' explicitly stated willingness to participate in the study, knowing full well what is involved). When action research project findings are shared with others (Step 8), participants are to be protected by maintaining confidentiality, that is, not revealing their identities.

Burns (2010, chapter 2) considers these issues in greater depth and breadth. The questions that she explores are as follows: Whose permission do you need for your research? Who will be affected by your research? Who should be told about your research, and how should the reporting be done when the research cycle is completed? (See also Burns, 2015, and Mills, 2018, for additional information on ethical considerations.)

Examine our sample action research projects to learn what the teacher researchers take into account when considering the ethics of their proposed projects.

Vocabulary Action Research Project: Step 4

Topic: Explicit instructional techniques for vocabulary expansion.
Question: What instructional approaches do I use to assist students in learning new vocabulary?
Primary way(s) to collect data: Self-observation and a tally sheet (Appendix 7-A).
Ethical considerations: Because I am essentially looking at myself and not my students and because I am collecting this information to gain an understanding of my own teaching (for the eventual improvement of my teaching), I do not need to solicit informed consent from my students. If I ever report the results of my project to others, there will be no need to identify any of my students (except for, in the most general of terms, their proficiency levels and backgrounds to situate my study). To be fair and inclusive, however, I will probably tell my students about the project and my purposes for engaging in it.

Amount-of-Reading Action Research Project: Step 4

Topic: Amount of in-class silent reading.
Question: How much silent reading do my students engage in during class?

Primary way(s) to collect data: Record-keeping sheet completed during or immediately after class (e.g., Appendix 7-B).

Ethical considerations: I am not focusing on individual students in my project, so there is no need to solicit students' informed consent to participate in my action research. Because students are likely to see me using my cell phone stopwatch and filling in my record-keeping sheet, I'll explain to them the purpose for my data collection and why the results are important for me (and for them). The results of my research may be of interest to my colleagues. I'll likely share results with them informally; however, there would be no reason to identify any of my students, so their identities will be protected.

7.1.5 Implement Action Research Plan (Step 5)

It is during the implementation phase of the action research project when the preceding steps (Steps 1–4) are put into action. What types of data are collected, how they are collected, and how often they are collected are variable; what should remain constant, however, is *careful*, *regular*, and *systematic* data collection. After data are collected, they are compiled and coded in preparation for data analysis (Step 6).

Consider the implementation phase in our sample action research projects.

Vocabulary Action Research Project: Step 5

Topic: Explicit instructional techniques for vocabulary expansion.

Question: What instructional approaches do I use to assist students in learning new vocabulary?

Data collection: During class, I'll self-monitor by paying careful attention to the planned (and unplanned) ways I assist students in learning new vocabulary. Immediately following each Tuesday and Thursday class for a month, I'll fill out my tally sheet (Appendix 7-A) by indicating the instructional techniques used in class. If I use a technique that is not listed, I'll add it to the tally sheet.

Amount-of-Reading Action Research Project: Step 5

Topic: Amount of in-class silent reading.

Question: How much silent reading do my students engage in during class?

Data collection: For the first half of the semester, I'll come to class with my cell phone stopwatch in hand (or use the classroom wall clock) to keep

track of the time (in minutes) that students read silently in class (when the whole class is reading silently). I'll record their reading time on the record-keeping chart (Appendix 7-B, column A). At the end of my initial record keeping, I'll determine if I need more data (and will continue collecting data into the second half of the semester, if needed).

7.1.6 Draw Conclusions (Step 6)

During this important step of the action research process, we engage in a range of activities, with the goal being to answer our research question(s), draw conclusions from our data, and resolve the dilemma (or satisfy the curiosity) that initially led to our research question(s). Teacher researchers aim to use insights gained during this stage of action research "to build an interpretation" that will lead to a "data-driven decision to take some action" (Farrell, 2007, p. 102). Before we can decide which small or large action(s) to pursue to improve the teaching and learning in our classes, we *analyze* and *interpret* our data and then *reflect* on findings in light of the research question(s) guiding the project. (See Efron & Ravid, 2013, for a discussion of data analysis and interpretation.)

The analysis stage involves two or more of the tasks presented in Concept 7.3. For example, if we were investigating students' reading strategy use, we might *assemble* our data to identify the reading strategies that students used, when they used them, and their purposes for using them. To facilitate an analysis of these data, we might display our findings in charts, tables, or diagrams. Such displays can help us find recurring *characteristics*, *hierarchies*, *patterns*, *relationships*, *sequences*, or *trends* (Concept 7.3). Insights gained from our findings will help us *interpret* our data—that is, find meaning in the data and then connect the data back to our guiding research question(s).

Concept 7.3: Data-Analysis Tasks

Analysis Tasks (Set I)	*Example Tasks*
Assemble or transform data	Transcribe recordings of teacher instructions, tabulate numerical data, organize student reflection papers.
Categorize data	Divide vocabulary words—identified by students as unfamiliar—into groups of content and function words, or into content-obligatory and content-compatible words (Snow, Met, & Genesee, 1989). Separate post-reading questions posed by the teacher (or textbook) into categories (e.g., questions that require recall, a summary, a detail, the expansion of an earlier response, an explanation, an evaluation, an application, a judgment, personalization, an inference, an interpretation, a prediction, a restatement).

Compare data	Compare findings from one reading class with findings from another reading class. Compare results from highly motivated and less motivated readers. Compare students' receptiveness to one pre-reading activity and then another. Compare findings with other sources of data (e.g., from another teacher's classroom, from a published study).
Analysis Tasks (Set II)	*Example Findings*
Examine data for recurring	
(a) characteristics	Data reveal that slow readers use few, if any, pre-reading strategies on their own.
(b) hierarchies	Data indicate that students of all ability levels seem to value certain reading strategies more than others (e.g., more valued strategies—previewing, predicting, connecting text to background information; less valued strategies—specifying a purpose for reading, checking predictions, re-reading).
(c) patterns	Data show that both strong and weak readers benefit from filling in graphic organizers while reading and referring to them during post-reading tasks.
(d) relationships	Data suggest that students who use two or more vocabulary-collection techniques on their own are likely to have larger vocabularies than students who repeatedly use a single technique.
(e) sequences	Data reveal that descriptive passages assigned *before* cause–effect passages are appropriate for lower-level students.
(f) trends	Data demonstrate that students who have the opportunity to select their own reading materials tend to read increasing numbers of pages over the course of a semester; older students enjoy reading non-fiction themes more than fiction.

It is at this critical juncture in our investigation when we consider (by ourselves, with colleagues, or with our students) important questions such as these: What do these results mean? What have I learned about myself? About my students? About reading? About reading instruction? About the reading curriculum? How can I use the insights gained to improve the teaching and learning that goes on in my classroom? Based on my findings, which aspects of my classroom instruction should remain the same and which should be modified? And how might I modify instruction to create a more effective learning environment?

Let's revisit our two sample action research projects to see how data are analyzed, interpreted, and reflected upon to generate new ideas for improved teaching and learning.

Vocabulary Action Research Project: Step 6

Topic: Explicit instructional techniques for vocabulary expansion.

Question: What instructional approaches do I use to assist students in learning new vocabulary?

Data analysis and interpretation: After a month of data collection, I tabulate my tally sheets to determine which explicit vocabulary-teaching techniques I use and how frequently I use them. I look for trends and, if appropriate, may categorize techniques into different types (e.g., student centered, teacher centered, passive, active). I interpret my data with the goal of discovering my current preferences as well as techniques that are under-used or not used at all.

Reflections on results and generation of new ideas for improved teaching and learning: I've thought about the patterns that have emerged from my data and tried to understand why I'm drawn to certain vocabulary-teaching techniques and why I shy away from others. I've noticed that I regularly use definitions, synonyms and antonyms, illustrations, and mime to teach new vocabulary items. Not even once, I'm embarrassed to admit, did I use **analyses of word parts**, cognate awareness tasks, collocation awareness activities, concept-of-definition maps, corpus analyses, **lexical sets**, or **semantic feature analysis**! Now that I think about it, I probably had opportunities to make use of some of these techniques, especially on the days my class meets in the computer lab. I'm probably disadvantaging my students by not exposing them to a broader range of vocabulary-learning techniques. My vocabulary-teaching repertoire may be especially narrow because of my own language learning experiences. When I was a language student, my teachers mainly used translation, but that won't work in my multilingual classroom.

Amount-of-Reading Action Research Project: Step 6

Topic: Amount of in-class silent reading.

Question: How much silent reading do my students engage in during class?

Data analysis and interpretation: At the end of the data-collection period, I transform my data by calculating (a) the total amount of in-class silent reading time, by adding up minutes in column A of my record-keeping sheet (Appendix 7-B); (b) the total amount of class time, by adding up minutes in column B of my record-keeping sheet; and (c) the percentage of class time dedicated to extended silent

reading, by dividing total minutes of silent reading time by total minutes of class time. Results should provide concrete evidence of time on task (i.e., time spent reading silently).

Reflections on results and generation of new ideas for improved teaching and learning: As I might have predicted, the total amount of time that my students engage in silent reading is minimal, often less than five minutes per class meeting. There were days when students read less than one minute! It is actually disturbing to learn, from authentic data (not speculation), how little silent reading is going on in class. It is especially troublesome knowing that students need to be reading to improve their reading abilities. We spend most of our time discussing readings, going over vocabulary, and reviewing textbook exercises.

I wonder what the school principal would say if she were to walk by my classroom and it was totally silent, with students reading silently and the teacher circulating while monitoring and quietly interacting with students. I'm convinced now that I need to reorganize my lessons to make time for more reading. As Grabe (2009) affirms, there are no shortcuts. Students learn to read by reading.

7.1.7 Adopt or Adapt and Monitor New Ideas for Improved Teaching and Learning (Step 7)

Quote 7.7

> At the heart of action research is the idea that language teachers must take some action to improve their practice.
>
> Farrell and Jacobs (2010, p. 117)

The goal of action research is to arrive at this point in the process. That is, we normally engage in action research not only to gain a better understanding of our classrooms (Steps 1–6) but also to take some action to improve classroom instruction (Step 7). One way to enhance classroom teaching and learning, after having reflected on the results of our research, is to generate practical solutions and a plan to implement and monitor them. (It is likely that action researchers will be contemplating such issues throughout the entire project, not *just* at this point.) While "searching" for solutions, we should not assume that there is a single solution waiting to be discovered; rather, there are probably many practical options from which we can choose. We may adopt a brand-new approach, technique, or

set of materials (that we have read about or heard about at a conference) on an experimental basis. Or we might adapt, in a small or grand way, a tried-and-true technique used by colleagues. The key is to use action research results, combined with insights from reading theory and other research, to try out new classroom practices (see Farrell & Jacobs, 2010).

When we try out new ideas that emerge from our action research, we are wise to view them as "experimental." Because we cannot possibly know how well new ideas will work in our classes, it is natural to consider initiating a follow-up action research project to determine their effectiveness. Of course, this entails going back to Steps 1 and 2 to begin the process again.

What we learn from the action research process is that it is neither conclusive nor static or self-contained. In fact, this is the very essence of the iterative process. In exploring a narrow area of a larger topic, we inevitably encounter new questions, which lead to new action research projects. The cyclical nature of action research creates multiple opportunities for new and manageable action research projects and lifelong learning.

Let's revisit our two case studies to discover some of the practical solutions generated in response to the questions posed.

Vocabulary Action Research Project: Step 7

Topic: Explicit instructional techniques for vocabulary expansion.

Question: What instructional approaches do I use to assist students in learning new vocabulary?

Adoptions or adaptations of ideas for improved teaching and learning, accompanied by monitoring: Based on the results of my action research, I am now determined to expand my repertoire of explicit vocabulary-teaching techniques. My action plan for now will be to start out by experimenting with two techniques (from Appendix 7-A) that I have never used: concept-of-definition maps (see Section 6.3.1) and lexical sets (Zimmerman, 2009). In the future, I can experiment with other techniques. To gain more insights into these two techniques, I'll consult teacher resources (e.g., Graves, 2016; Graves, August, & Mancilla-Martinez, 2013; Webb & Nation, 2017; Zimmerman, 2009) and websites for practical suggestions.

There seems to be plenty of support for "spreading my wings." First, the research of others (e.g., Ganske, 2019; Nation, 2008; Webb & Nation, 2017) has indicated the value of explicit vocabulary teaching for developing readers. Second, my students' reading is likely to improve when they have a larger vocabulary, and they will be appreciative of my commitment to their vocabulary growth. Third, when I broaden my teaching repertoire, I simultaneously expose students to new strategies for building their vocabulary independently.

When I integrate these new vocabulary teaching techniques into my lessons (at points where they complement the texts and vocabulary to which students are being exposed), I'll be sure to observe students' responsiveness to the techniques and the adjustments that I make to my lesson plans to accommodate student needs. To evaluate the effectiveness of the techniques and the ways I integrate them into my classroom (as part of a follow-up action research project), I'll keep an after-class journal, noting my reactions and my students' reactions to the techniques. I'll also jot down notes on my lesson plans to reflect any changes made.

Amount-of-Reading Action Research Project: Step 7

Topic: Amount of in-class silent reading

Question: How much silent reading do my students engage in during class?

Adoptions or adaptations of ideas for improved teaching and learning, accompanied by monitoring: The results of my action research project reveal that my students spend minimal time reading silently in class. From everything I know about reading skills development, it is imperative that I increase the time that students spend reading silently in class.

My action plan is to systematically increase the amount of time that students spend reading silently in class. I'm going to experiment with a Scaffolded Silent Reading (ScSR; Reutzel, Jones, & Newman, 2010) routine two days per week for an entire semester. ScSR entails (a) students silently reading texts selected with teacher guidance, (b) teacher monitoring of and interaction with individual students, and (c) student accountability demonstrated in book (or text) response assignments. (See Section 6.1.1.2 for distinctions between ScSR and Sustained Silent Reading [SSR].)

Before starting the new routine, I will schedule a meeting with the school principal to tell her about my proposed plans, with the hopes that she'll understand my rationale for integrating ScSR into my instruction and be supportive of my efforts. Because she is a strong proponent of communicative language classrooms, I need her to appreciate the benefits of a quiet classroom, with students silently engaged in reading. For the meeting, I'll be prepared to (a) clarify the importance of silent reading for developing readers, (b) explain the differences between SSR (with which she might be familiar) and

ScSR, (c) explain the role that ScSR can play in a curriculum committed to reading skills development, and (d) report the support for ScSR provided by many well-known reading researchers.

When I initiate the ScSR routine, I'll keep track of students' time spent reading and make notes about students' text choices, concentration (or restlessness), and attitudes to ascertain the best time allotment to sustain student interest. Students' response assignments will give me insights into students' engagement with silent reading as well.

7.1.8 Share Insights with Colleagues (Step 8)

In the "final" stages of an action research project (if, in fact, there is such a thing as a final stage), we have the option of sharing what we have learned (i.e., findings, practical solutions, or insights about the action research process) with interested colleagues. There are two logical points in the action research process at which we can get the word out to our colleagues. We can do so immediately after drawing our conclusions (going from Step 6 to Step 8, as suggested in Figure 7.1). Or we can wait until we have done a round of adoptions or adaptations in response to our action research findings and then report our insights (going from Step 7 to Step 8).

We can share our action research experience with colleagues in our own institutions, with teachers attending professional conferences (in informal discussions, formal presentations, workshops, or poster sessions), and with interested professionals as part of an Internet chat group. We can also share insights by means of publications in school or district newsletters, in professional association electronic newsletters, or in professional peer-reviewed journals.

There are many benefits to disseminating action research findings. Although we often work alone in our classrooms, teachers experience similar challenges (and joys). The concerns of one teacher often reflect the concerns of her colleagues; similarly, the frustrations of one teacher often represent the frustrations of others. Because of common concerns and aspirations, we are typically interested in the insights of colleagues who have been engaged in action research. Although it takes time to disseminate information, the effort is worthwhile because of the so-called multiplier effect. That is, when we share what we have learned with others, increasing numbers of students become the beneficiaries of the research. When other teachers experiment with practical solutions introduced by teachers who have been engaged in action research, efforts to improve classroom instruction and student learning are more far-reaching. The potential for the multiplier effect extends the impact of a single action research project, thereby enhancing teaching and learning in multiple instructional contexts.

Let's consider the ways insights are disseminated in our two model projects.

Vocabulary Action Research Project: Step 8

Topic: Explicit instructional techniques for vocabulary expansion.

Question: What instructional approaches do I use to assist students in learning new vocabulary?

Sharing of insights with colleagues (after Steps 6 and 7 have been completed): Because every reading teacher (and, in fact, every language teacher) should facilitate their students' vocabulary growth, my colleagues should be interested in the results of this action research project. I am considering creating a poster, to be displayed at a local teachers' conference, that highlights the vocabulary-teaching techniques most commonly used in my classes and the new techniques I have tried out with my students. On the poster, I'll provide a rationale for explicit vocabulary teaching, a brief description of my action research project, an explanation of vocabulary-teaching techniques that might be of interest and ways to implement them in class, and a list of challenges encountered and the solutions that I tried out. I'm assuming that many teachers will gravitate toward the poster because we all know how critical vocabulary is for our students' language learning. (Note: There is no reason to identify any of my students by name on the poster; thus, their identities will be protected. If I want to include a photo of my students on the poster, I'll need to get their permission to do so.)

Amount-of-Reading Action Research Project: Step 8

Topic: Amount of in-class silent reading.

Question: How much silent reading do my students engage in during class?

Sharing of insights with colleagues (after Steps 6 and 7 have been completed in my follow-up action research project): I intend to share the insights that I gain from my experimentation with ScSR with other teachers in my school. This is important because students at all levels of instruction can benefit from silent reading, accompanied by teacher guidance and accountability measures. I'll probably start out by talking informally with teachers in my own area because I know them well and know that they are concerned about students' reading abilities. Then I'll write up a general set of teacher guidelines, outlining the general principles of ScSR, its standard procedures, some of the pitfalls that I experienced, and possible solutions. I plan to present the guidelines to my colleagues

at a faculty meeting and then schedule a department-wide (or possibly school-wide) discussion that could lead to a broader commitment to ScSR (or at least experimentation with it).

7.2 Conclusion

Quote 7.8

> Research engagement has the potential to be a powerful transformative force in the work and professional development of language teachers.
>
> Borg (2010, p. 391)

The eight-step action research process outlined in this chapter should be seen as a flexible framework for teacher-initiated research and reflection. Although we could not fully capture the truly iterative nature of the process in this chapter, the framework presented here, in our view, represents a manageable tool that we teachers can use to (a) understand our own realities (i.e., our classrooms, ourselves, our students and their needs) and (b) generate practical solutions to classroom issues. The action research process can truly be transformative (Borg, 2010). Those of us responsible for teaching reading can use action research to explore a wide range of reading-related topics.

In the two chapters that follow (Chapters 8–9), we introduce 12 model action research projects, six in each chapter. The projects align themselves with nine areas of critical importance to reading-skills development:

Chapter 8	*Chapter 9*
• Deliberate practice	• Strategic reading
• Motivation	• Main-idea comprehension
• Vocabulary	• Reading-lesson stages
• Discourse structure awareness	• Digital literacy
• Reading fluency	

The model action research projects showcase a variety of reading-related areas of interest, guiding research questions, and action research plans (with a focus on *where* to conduct the research, *who and what* to focus on, *what* types of data to collect, and *how*, *how often*, and *how long* to engage in the process). Because action research projects should be defined and structured by teachers for their *own* classrooms and instructional contexts, the models presented in the following chapters should be viewed as idea-generation tools, not as ready-to-go templates. We conclude Chapters 8 and 9 with additional research questions that can be used as springboards for other reading-related action research projects.

Appendix 7-A: Explicit Vocabulary Teaching Techniques: Sample Tally Sheet

Explicit Vocabulary Teaching Techniques[a]	*Week 4*		*Week 5*		*Week 6*	
	T	*Th*	*T*	*Th*	*T*	*Th*
Analysis of word parts						
Anecdotes or stories highlighting word meaning						
Associations						
Categorization						
Cognate consciousness raising						
Collocation awareness						
Computer-assisted vocabulary instruction						
Concept-of-definition maps						
Connections between new and known vocabulary						
Connotations						
Context clues						
Corpus analysis, including concordancing						
Definitions						
Discussion of word meaning(s)						
Examples and non-examples						
Games and puzzles						
Glosses						
Illustrations, pictures						
Lexical sets						
Memory aids (e.g., flashcards, mnemonic devices, vocabulary notebooks)						
Online dictionary consultation						
Pantomime and demonstrations						
Personalization						
Practice with multiple meanings						
Ranking, sorting, and matching						
Realia (i.e., concrete everyday objects, pictures)						
Recycling of vocabulary in varied contexts						
Register variation (including spoken and written registers)						
Semantic feature analysis						
Semantic mapping						
Synonyms and antonyms						
Thematic groupings						
Translation						
Word-family tasks						
Word learning strategies						
Word splash						
Other						

[a] Teachers can adjust the left-hand column to include vocabulary teaching techniques that are endorsed by their schools, that they have read about and want to try, that they have seen demonstrated in teacher workshops, and so forth.

Appendix 7-B: Sample Record-Keeping Sheet to Document In-Class Silent Reading Time

Class: _____

Week/Date	*A: In-Class Silent Reading Time (in Minutes)*	*B: Length of Class Meeting (in Minutes)*
Wk 1/February 16	2	90
Wk 1/February 18	4	90
Wk 2/February 23		

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The following citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Action research initiatives and case studies*, see Borg and Farrell (2007), Farrell (2006), Makalela (2009).
- *Comparisons of different types of research*, see J. D. Brown (2014), J. D. Brown and Rodgers (2003), Paltridge and Phakiti (2015).
- *Conditions that facilitate teacher research*, see Borg (2006).
- *Teacher conceptions of research in 13 countries*, see Borg (2009).

8 Action Research Projects
Set I

This chapter showcases six easy-to-adapt action research projects related to a subset of the curriculum-design principles and teaching practices introduced in Chapters 5 and 6. The focal points of these teacher-initiated action research projects are (a) deliberate practice, (b) motivation, (c) vocabulary, (d) discourse structure awareness, and (e) fluency. Of particular interest are the following:

- Model action research projects that can be easily adapted by interested teachers.
- Steps that teachers can follow (likely with some adaptation) to engage in teacher-initiated enquiry (as introduced in Chapter 7).
- Easy-to-use data-collection techniques.
- Additional research questions related to each focal area that can guide other meaningful action research projects.
- Teaching ideas that can be adapted for classroom use to promote reading skills development.

In this chapter, we highlight six reading-related action research projects that showcase different aspects of L2 reading instruction, research questions, and action research plans. (See Burns, 2013; Mills, 2018; Richards & Farrell, 2005, for more general discussions of action research.) The model action research projects represent just a sampling of the types of action research projects that teachers can initiate to better understand L2 reading, their teaching of reading, their students, and the materials that they use in their classes. The model projects build upon (a) curriculum principles 2, 3, 4, 5, and 6 introduced in Chapter 5 and (b) teaching ideas introduced in Chapter 6 that center on deliberate practice, reading motivation, vocabulary, discourse structure awareness, and reading fluency.

Quote 8.1

> The term *action research* refers to two dimensions: the word *research* … refers to a systematic approach to carrying out investigations and collecting information that is designed to illuminate an issue or problem and to improve classroom practice. The word *action* refers to taking practical action to resolve classroom problems.
>
> Richards and Farrell (2005, p. 171)

Table 8.1 Model Action Research Projects (Set I)

Model Action Research Project	*Topic*	*Primary Way(s) to Collect Data*
8.1.1	**Deliberate Practice**: Teacher as coach, an essential element of deliberate practice	Teaching logs (and face-to-face meetings with a collaborating colleague to compare and discuss teaching-log entries)
8.1.2	**Motivation:** Students' perceptions of themselves as readers	Document gathering (student writing assignments, student portfolios, teacher annotations about students on a class roster)
8.1.3	**Vocabulary**: Students as independent vocabulary collectors	Questionnaires (completed by students) and student responses to a ranking task
8.1.4	**Discourse Organization**: Discourse structures in textbook reading passages	Record-keeping form (to create an inventory of textbook reading passages, predominant discourse structures, and matching graphic organizers)
8.1.5	**Discourse Organization:** Signal words that provide cues to discourse structures	Document gathering (pre- and post-tests), teaching logs
8.1.6	**Fluency**: Oral paired reading	Record-keeping form

We approach the model action research projects in this chapter (Table 8.1) in the same way that we approach those in Chapters 7 and 9. That is, the projects described here should be viewed as flexible models—not as rigid templates—that can be adapted, in small or large ways, for different instructional settings. In our description of these model action research projects, we focus on the first three steps of the eight-step framework introduced in Chapter 7: purpose and area of interest (Step 1), key research question (Step 2), and action research plan (Step 3). We hope that teachers who read over these model projects (and the additional research questions listed toward the end of the chapter) become motivated to pursue action research on their own (or with colleagues), using these descriptions as springboards for implementation.

8.1 Model Action Research Projects

Quote 8.2

> [Data are gathered] with the goals of gaining insight, developing reflective practice, effecting positive changes in the school environment (and educational practices, in general), and improving student outcomes and the lives of those involved.
>
> Mills (2018, p. 10)

8.1.1 Deliberate Practice

Purpose and area of interest: The concept of deliberate practice (Ericsson & Pool, 2016) is an interesting one; Munger and Murphy (2014) provide a strong justification for using a deliberate practice framework to advance students' reading abilities. One important element of deliberate practice is the *teacher as coach*, that is, the teacher who (a) helps students understand goals and work to attain them, (b) monitors students' progress and makes suggestions for improvement, and (c) provides opportunities for learners to modify their behaviors based on feedback received. A second important element of deliberate practice is *learners who understand what they are aiming for and then target those behaviors*, that is, learners who have clear goals, have plans for reaching those goals, concentrate on what they want to attain, monitor their progress, and are willing to modify behaviors in response to feedback provided. A third element of deliberate practice that lends itself well to reading instruction is the *focus on a particular aspect of the skill to be mastered* (e.g., main idea comprehension, reading fluency, discourse structure awareness, strategic reading) and *conscious efforts to improve it*. Because reading textbooks and curricula have not (yet) been designed with deliberate practice in mind, it is worth engaging in manageable action research projects to determine how to translate these concepts, one at a time, into reality in the reading classroom. For the purposes of this action research, the focus is on the *teacher as coach*.

Key research question: **What can my teacher colleague and I do, in our reading lessons, to assume the role of "coach" as depicted in discussions of deliberate practice?**

Action research plan:

Where? In class.

Who/What (to focus on)? Teachers as coaches.

What (data to collect)? Teacher logs (and discussions with colleague collecting the same type of data).

How? How often? How long? This action research project is completed with a colleague who is similarly interested in developing the skills to be a reading coach, the first step toward integrating the essential elements of deliberate practice into instruction. Both teacher researchers keep a regular written record (in a teaching log) of *how* and *how well* they integrate the characteristics of a reading coach into their teaching (Table 8.2). Every month, they meet to compare and review teaching-log entries, with the goal of identifying reading-coach behaviors that are effective (and should be continued) and that can be improved. The monthly cycle of (a) recording coach-like behaviors in teaching logs and (b) meeting to discuss log entries continues until the teacher researchers feel comfortable with the progress that they are making toward taking on the role of coach.

Additional comments: When collaborating teachers reach the point of feeling comfortable taking on the role of reading coach, they could conduct

Table 8.2 Teaching Log for Recording Focal Teaching Behaviors Related to the Teacher-as-Coach, an Essential Element of Deliberate Practice

	Class_____Date_____
In an effort to integrate deliberate practice into my reading instruction, my first attempt will be to focus on my role (the teacher role) as "coach." How and how well do I …	
… help students understand their goals for a particular aspect of reading?	
… help students work to attain those particular reading goals?	
… monitor students' progress on attaining their goals?	
… provide suggestions for focal reading-skill improvement?	
… adjust my lesson plans so that learners have time to work on modifying their reading habits based on my feedback?	

a follow-up action research project examining the effects of deliberate practice. If one or both of the teachers have two sections of the same class (same level of instruction, same materials, same course goals), they could proceed as follows: one class could serve as a control group (taught following standard procedures, without opportunities for deliberate practice), and the other could serve as a treatment (or experimental) group. While also serving as students' reading coach, the teacher researcher could integrate deliberate practice into instruction with the treatment group (but not the control group). A pre–post measure of focal reading behaviors, administered to both groups, could indicate the effects of deliberate practice.

8.1.2 Students' Perceptions of Themselves as Readers

Purpose and area of interest: Students who self-identify as readers and who enjoy reading are more likely to develop into skilled readers (Guthrie & Taboada Barber, 2019; Guthrie & Wigfield, 2000; McCardle, Chhabra, & Kapinus, 2008). Such students typically have a sense of self-efficacy, a willingness to read, and an openness to reading instruction and related tasks. By means of action research on students' self-perceptions, teachers can develop a better sense of students' attitudes toward reading and their self-images as readers. Learning *what* students like to read, *where* they like to read, and *when* they like to read in addition to *which* students really do not like to read can be useful when working with students individually

and as a whole class. Equipped with such valuable information, teachers can then work toward building students' perceptions of themselves as readers and focus on relevant motivation-building activities (Dörnyei & Ushioda, 2011; Guthrie & Taboada Barber, 2019; McCardle, Chhabra, & Kapinus, 2008).

Key research question: **What are students' images of themselves as readers?**

Action research plan:

Where? In a course with reading goals.

Who/What (to focus on)? Full class of language students.

What (data to collect)? Student writing assignments, student portfolios, and teacher annotations on class roster.

How? How often? How long? At the beginning of the school year, at some point during teacher and student introductions, the teacher talks about herself as a reader, sharing information about *what* she likes to read, *when* she likes to read, and *where* she likes to read. The teacher encourages students to ask whatever questions they have about her reading preferences and habits. After these interactive introductions, students are asked to select *one* (or more) of these prompts: (a) What do you like to read and why? (b) When do you like to read and why? (c) Where do you like to read and why? Alternatively, students can choose one (or more) of these prompts: (a) Write about an enjoyable book that you've read; (b) Write about a place where you enjoy reading; (c) Write about a time when you remember enjoying reading. (Students who do not exhibit any interest in reading at all can be invited to write about someone they know who likes to read.) Students reflect on the question of their choice, jot down a few notes, write a response, and then talk about their responses in pairs or groups or as a class (depending on the time available and the size of the class).

While students are speaking with one another, the teacher makes mental notes (or, better yet, annotations next to students' names on a class roster) of students' comments that reveal their positive, neutral, or negative experiences with reading. Then, students are asked to place their written (and dated) responses in their portfolios. The same (or similar) questions can be posed and the same (or similar) procedures can be followed once a month for four months. When student portfolios are collected at the end of the four-month period, a (partial) record of students' views about reading and themselves as readers exists.

Additional comments: During the first class session in which students are asked to reflect on their own reading experiences, care should be taken to orient students to the task. As students become comfortable with the task, they may either need less time to express their views or want additional time to explain their evolving opinions about reading.

A review of class-roster annotations and student portfolios, with four samples of students' written work, may lead to insights into students' evolving views about themselves as readers. The teacher researcher can look for words, phrases, and anecdotes that indicate positive, negative,

or neutral orientations toward reading. Careful attention to information about what types of books students like to read, where they like to read, and when they like to read could prove insightful. The teacher researcher can use insights gained to encourage reading and to devise in-class activities that build students' self-images as readers.

8.1.3 Students as Independent Vocabulary Collectors

Quote 8.3

> Vocabulary [is] the fuel of language, without which nothing meaningful can be understood or communicated.
>
> Gardner (2013, p. 2)

Purpose and area of interest: Explicit vocabulary instruction has an important place in L2 classrooms (Gardner, 2013; Graves, August, & Mancilla-Martinez, 2013; Kame'enui & Baumann, 2012; Nation, 2009; Zimmerman, 2009), yet we know that it is not possible to teach students all the words and phrases that they need to know. Thus, students need to develop strategies for independent vocabulary learning. Some students are natural collectors of vocabulary, while others need to be introduced to and encouraged to use different word-collection techniques. As part of this action research project, teachers introduce students to different ways of collecting words; the goal is for students to discover and become comfortable with at least one new vocabulary-collection technique that complements their own learning styles.

The results of this action research project are likely to lead to insights about students' responsiveness to different vocabulary-collection techniques. This knowledge could influence the ways teachers communicate to students about independent vocabulary building. An added benefit, of course, may be teachers' familiarization with less traditional word-collection techniques—which students have devised on their own—that can be shared with other students.

Key research questions: **Which vocabulary-collection techniques do students use independently? Which techniques should I integrate into class lessons to encourage autonomous vocabulary learning? Which vocabulary-collection techniques do students like best and why?**

Action research plan:

Where? In one or more language classes with reading aims.

Who/What (to focus on)? Language students (full class).

What (data to collect)? Student questionnaire and responses to ranking task.

How? How often? How long? At the beginning of this project, the teacher researcher asks students to complete a questionnaire (see Table 8.3 for sample items) on which they indicate the ways they collect vocabulary

Table 8.3 Sample Questionnaire Items about Vocabulary-Collection Practices

How do you collect words that you want to remember? Read the statements on the left. Place a check mark (✓) in the appropriate space to the right. Remember, there are no right or wrong answers.			
	I Agree	I Disagree	
A. I do not collect words.	—	—	
[If you disagree with (A), continue with statements below.]			
	Always	Sometimes	Never
B1. I write new words and their translations on vocabulary cards.	—	—	—
B2. I keep a list of new vocabulary words in a notebook, on my cell phone, or in a computer file. Next to each word, I write a definition. I add to the list whenever I hear or read a new word that I want to remember.	—	—	—
B3. I make paper flashcards for new words. On one side, I write the word and part of speech (and pronunciation). On the other side, I include a definition, an example sentence, and/or something special to help me remember the word.	—	—	—
B4. I use online programs (e.g., https://quizlet.com) to create flashcards that I can review easily.	—	—	—
B5. I keep a special vocabulary notebook (or computer file), organized by word families and idioms. Next to each word, I indicate the part of speech, copy original sentence, and write a sentence of my own. Next to the idioms, I jot down something to help me remember the meaning.	—	—	—
B6. I organize new words that are interesting to me by topic. I have a separate page/file in my notebook, on my computer, or on my cell phone for each topic.	—	—	—
B7. I practice new words with friends; we sometimes quiz each other for fun.	—	—	—
B8. I decide on a key word in my first language that helps me remember the new word.	—	—	—
B9. Other	—	—	—

that they want to learn and review on their own. Then, over the course of a full semester, the teacher "formally" integrates the techniques listed on the questionnaire (except for the first item) into classroom instruction, one at a time. (If students list additional techniques on their questionnaires that might prove useful for their peers to try out, the teacher can add them to the vocabulary-collection options introduced to and practiced by students.)

At some time every two weeks (or every week), 5–10 minutes of class time is dedicated to a new vocabulary-collection technique, with

emphases on procedures, benefits, practice, and the "naming" of the technique (the latter for ease of reference throughout the semester). Students who have already had experience with the technique (as indicated in questionnaire responses) can be invited to share insights with classmates; student "testimonials" for a given technique often have more positive impacts than teacher endorsements.

During the week(s) dedicated to a given vocabulary-collection technique, students are given opportunities to practice it as part of pre-, during-, or post-reading activities (when most appropriate) to demonstrate the versatility of the technique. Students are also encouraged to *use* (some of) the vocabulary that they have collected in one or more purposeful tasks; for example, during a summary writing activity, students can be asked to use at least two vocabulary words from their flashcard collection. Alternatively, students can be asked to work in small groups, pick three words from among those recently collected, ask other group members if they know the word and how it is used, share definition(s) of the word with group members, and explain why the word is interesting to them.

Toward the end of the semester during which vocabulary-collection techniques have been introduced, students rank order the word-collection techniques practiced in class, using the labels or descriptions agreed upon in class (see Table 8.4). If there is time, students can be invited to share rationales for their favorite techniques with classmates.

Additional comments: For this action research project, teacher researchers set aside time to devise and administer a questionnaire (like Table 8.3) and later a ranking form (like Table 8.4). Introductions to each vocabulary-collection technique and hands-on sessions that permit meaningful practice are planned as well. As a first step, teachers collect and review initial student questionnaire responses to determine which vocabulary-collection techniques students are familiar with. Questionnaire results are used to make decisions about how to sequence the presentation of targeted techniques in class (e.g., from most familiar to least familiar, most commonly used to least commonly used). Questionnaire responses

Table 8.4 Sample Ranking Form That Allows Students to Indicate Preferences for Different Vocabulary-Collection Techniques

Rank order the vocabulary-collection techniques that we've practiced in class (1 = my favorite; 8 = my least favorite). Which one do you like the best? Which one do you like the least? Provide a reason for your top-two ranking decisions.

Rank (1–8)	Vocabulary-Collection Techniques	Reason for Ranking Decision
	__Vocabulary cards with new words and translations.	
	__List of new vocabulary—in a notebook, on my cell phone, or in a computer file—with definitions.	
	__Other	

can also be used to identify students who might be invited to share previous experiences with vocabulary-collection techniques during introductory activities. Toward the end of the project, teachers tabulate students' rank-ordered responses to identify students' vocabulary-collection preferences, which can prove useful for future instruction.

8.1.4 Discourse Structures in Textbook Reading Passages

Quote 8.4

> Good readers are tuned in to the ways that information is organized [in the text] and to the signaling mechanisms that provide the cues to this organization.
>
> Grabe (2009, p. 243)

Purpose and area of interest: A number of studies argue persuasively that student awareness of discourse organization enhances reading comprehension (e.g., Grabe, 2009; Jiang & Grabe, 2007; Jiang, 2012; Meyer & Wijekumar, 2017). Discourse organization can be explored with our students in numerous ways, for example, using graphic organizers, scrambled paragraphs, semantic mapping, text analyses, text previewing (Blachowicz & Ogle, 2008; Grabe, 2009; Jiang & Grabe, 2009), and the more explicit teaching of signal words (see Model Action Research Project 8.1.5).

This action research project *precedes* teaching and entails the steps that teachers can take to (a) identify key discourse patterns in the texts that are to be assigned to students and (b) match those discourse patterns to appropriate graphic organizers (see Appendix 8-A; see also Lapp, DeVere Wolsey, Wood, & Johnson, 2015).

As a result of this action research project, teachers fine-tune their abilities to match required readings to graphic organizers that showcase prominent organizational text features. After the best matches have been determined, teachers are in a better position to plan effective lessons that link graphic organizers and readings, thereby raising students' awareness of common textual patterns.

Key research question: **Which graphic organizers complement the reading passages that are to be assigned to students?**

Action research plan:

Where? Anyplace the teacher researcher or team of teacher researchers can read and concentrate.

Who/What (to focus on)? Textbook reading passages and graphic organizers that depict common discourse structures.

What (data to collect)? Itemization (on a record-keeping form) of discourse structures found in textbook reading passages and graphic organizers that complement those discourse structures.

Table 8.5 Record-Keeping Sheet to Create an Inventory of Textbook Reading Passages and Common Discourse Patterns and Graphic Organizers

Title of Textbook Reading Passage	*Common Discourse Patterns (and Graphic Organizers)*	*Location of Discourse Patterns*
Looking into the Eyes of a Robot (Savage, 2017)	Definition Cause–effect Problem–solution	Paragraph 2 Paragraphs 4 and 5 Paragraph 6

How? How often? How long? With the course textbook and Appendix 8-A in hand, the goal of the teacher researcher is to match the prominent organizational features in textbook reading passages (and sections within them) with common graphic organizers. The teacher starts out by looking for text segments that reveal one or more text structures (e.g., definitions, comparison–contrast, cause–effect, process or sequence, problem–solution, description or classification, argument, for–against, and chronology). By keeping an "inventory" of reading passages, their predominant discourse structures, and matching graphic organizers, the teacher researcher has a valuable resource for planning lessons during which students' awareness of discourse organization can be raised. (See Table 8.5 for a sample record-keeping sheet entry.)

Additional comments: What will take a concentrated effort, on the part of the teacher researcher, is the analysis of reading passages (and their parts) to determine their most notable discourse patterns. It is probable that more than one discourse pattern will be present in most texts. For example, the opening paragraph of a text may include the definition of a key concept, aligning itself with a common definition frame (Appendix 8-A, pattern 1). What might follow are paragraphs describing cause–effect relationships (Appendix 8-A, pattern 3) and then a concluding section that highlights problems (as a consequence of the effect introduced earlier) and solutions (Appendix 8-A, pattern 5). That more than one discourse pattern is likely present in a text suggests that more than one graphic organizer will be paired with the text for instructional purposes. In some cases, the teacher researcher may need to create graphic organizers if the texts do not follow typical patterns. After texts are linked to the most appropriate graphic organizers, the teacher is ready to integrate graphic organizers and discussions of discourse structure into lesson plans.

8.1.5 Signal Words That Provide Cues to Discourse Organization

Purpose and area of interest: Good readers can identify text markers (i.e., signal words) that reveal text organization and provide clues to what is important in a text (see Chapter 3, Section 3.2.9; see also Hebert, Bohaty,

Nelson, & Brown, 2016; Pyle et al., 2017). Text markers (Appendix 5-A) signal cause and effect, comparison and contrast, problem and solution, conclusion, continuation, emphasis, examples, hedging, sequence or chronology, time, and so forth. Developing readers benefit from instruction that focuses on the identification of common text markers and their functions (in the texts that they are reading). To make this action research project both meaningful and manageable, only the most salient signal words, that is, those signal words that students are likely to encounter in their texts, are explored.

At a minimum, two important outcomes could emerge from this action research project. First, because of the extra attention paid to targeted signal words, students develop an ability that is critical for proficient reading, specifically the ability to identify clues that signal *how* information is organized and *what* is important. Second, teacher researchers learn how to bring signal words to the conscious attention of their students; such knowledge expands a teacher's repertoire of teaching techniques.

Key research question: **How can I help my students learn to identify salient signal words in the texts that they are reading?**

Action research plan:

Where? Before and during class.

Who/What (to focus on)? Words that signal discourse organization in reading passages assigned to students.

What (data to collect)? Pre- and post-tests; teaching log.

How? How often? How long? To determine which signal words are worthy of attention, teacher researchers (by themselves or with peers) read over passages that are to be assigned to students with the intention of identifying the signal words that predominate (consulting Appendix 5-A). As an example, teachers might see *sequence* markers (i.e., words or phrases that signal a particular order of ideas or events), *contrast* markers (i.e., words that signal differences, divergent points of view, changes in perspective), and *example* signals (i.e., words or phrases that indicate that an example is about to appear) in most textbook passages but *conclusion* markers in only a few passages. Based on these observations, the teacher may decide to focus on *sequence* and *contrast* markers (rather than *example* signals because students have demonstrated a grasp of those signals in their writing).

The teacher researcher then selects a (textbook) reading passage with several examples of the targeted signal words. After distributing the reading passage to the class, students are directed to read the text while *underlining* sequence markers and *circling* contrast markers. This activity serves as a pre-test and indicator of student familiarity with sequence and contrast markers. As the semester progresses, the teacher focuses students' attention on sequence and contrast markers as they appear in class readings. As part of instruction, students are guided in identifying the markers, discussing them, and exploring their textual functions as they are

found. Students keep a running list of the markers that they encounter in their notebooks. Periodically, students compare lists and adjust their own to compile more complete lists. Meanwhile, the teacher keeps a log of the signal words that are encountered by the class (identifying the dates of first and repeat encounters). In those logs, the teacher briefly comments on the ways certain words are explained as well as the questions and difficulties that students experience. After students have encountered targeted markers numerous times and in varied contexts (perhaps after one to two months), a post-test similar in format to the pre-test is administered, except that students are also asked to explain the function of each underlined or circled signal word.

Additional comments: To determine if students have developed a heightened familiarity with and understanding of target signal words, the teacher compares students' pre- and post-test scores. The post-test, in addition to revealing improvements in students' abilities, might highlight signal words that merit more explicit attention. A review of teaching-log notations, with test results in mind, can assist teachers in determining which instructional techniques worked and which techniques did not work so well.

8.1.6 Oral Paired Re-Reading

Purpose and area of interest: The myth that L2 learners should not be asked to read aloud has been debunked (N. J. Anderson, 2008; Nation, 2009). What we have to keep in mind, when asking students to read aloud, is that oral reading is most effective with passages that students have *already* read. Oral paired re-reading tasks represent one viable instructional technique for promoting reading fluency. (See Appendix 8-B for a listing of other reading fluency activities.) One question that reading teachers often ask themselves, when integrating oral paired re-reading tasks into their lessons, centers on the pairing of students (e.g., students with similar reading abilities, dissimilar reading abilities). The purpose for this action research project is to gain insights into this issue.

As a result of this action research project, teacher researchers are likely to gain insights into pair work, in general, and pair work for oral paired re-reading activities, more specifically. Experience has taught many teachers that for some types of language learning activities, it is wise to group students with mixed abilities; for others, it is effective to group students with similar abilities. This action research project helps teachers determine effective ways to pair students for oral paired re-reading activities (of the type described here).

Key research question: **Which students should be paired for the most effective use of oral paired re-readings tasks?**

Action research plan:

Where? In class.

Who/What (to focus on)? Student-pair assignments.

Table 8.6 Standard Procedures for Oral Paired Re-Reading

1. Students work in pairs with passages that they have already read for other purposes.
2. Student A reads the passage aloud for a designated period of time (e.g., 45–60 seconds) as quickly and as accurately as possible. While Student A reads aloud, Student B follows along and assists Student A if necessary.
3. At the end of the designated time period, Student A marks the end point of the read aloud (i.e., last word read aloud).
4. Students A and B switch roles. Student B reads the exact same passage as Student A, starting at the beginning.
5. After the same designated time period, Student B marks the end point of the read aloud.
6. Students A and B then repeat the procedure (Steps 1–5) for a second round, re-reading the same exact text from the beginning. The goal is to advance further in the text in the second round.
7. The number of words gained on the second reading is recorded.

What (data to collect)? Names of students assigned to each pair, with some indicator of the type of pair (e.g., students with similar or different reading abilities, motivational profiles, attitudes toward reading, first languages).

How? How often? How long? To answer the action research question, the teacher researcher follows standard procedures for oral paired re-readings (Table 8.6). Each time students engage in oral paired re-readings, the teacher researcher follows the same procedures *but* experiments with different student pairings (e.g., students with similar or different reading abilities, motivational profiles, attitudes toward reading, first languages). For the duration of this action research project (which could span five to ten class sessions depending on the number of different pairing configurations tried out), the teacher researcher keeps track of student pairing decisions on a record-keeping form. To assist with later analyses, the teacher researcher jots down notes about student enthusiasm for the task, students' fluency improvements (based on how far they get in the text), student cooperation with partners including willingness to help each other, and any other behaviors worth noting.

Additional comments: When record-keeping form entries are reviewed, the teacher researcher tries to determine which types of student pairings result in the most effective oral paired re-readings. The goal is to identify pairing configurations that lead to notable fluency improvement, greater cooperation between students, and the most positive attitudes toward reading and the task.

Initially, class time needs to be set aside to orientate students to the activity and "sell" them on the importance of fluency activities. After an introduction to basic procedures, just a few minutes of class time are needed for each oral paired re-reading session. It is a good idea to allot a few additional minutes to each session to (a) solicit student reactions and self-reports on fluency gains and (b) offer encouragement.

8.2 Additional Questions to Guide Action Research

The five focal areas explored in this chapter have the potential for many action research projects. Here we list some additional research questions that might spark the interests of teacher researchers. The best questions, of course, are those that help teachers understand the effectiveness of their own teaching, the usefulness of certain teaching techniques, student responsiveness to different classroom procedures, student grasp of materials, and so forth. (Note: asterisks indicate model action research projects described in Grabe & Stoller, 2011.)

8.2.1 Deliberate Practice

Additional action research questions related to deliberate practice include the following. The first question represents a possible follow-up to Model Action Research Project 8.1.1.

- In my role as reading coach, how can I improve upon the area(s) that proved to be less than effective (in my previous action research project [8.1.1])?
- What steps can I take to help learners understand what they are aiming for and then focus on those reading behaviors?
- What are effective ways to guide learners in (a) establishing clear goals, (b) making plans for reaching those goals, (c) concentrating on what they want to attain, (d) monitoring progress, or (e) modifying reading behaviors in response to the feedback received?
- Which aspects of my students' reading-skill development (e.g., main idea comprehension, reading fluency, discourse structure awareness, strategic reading) deserve deliberate practice?
- How can I get my students to truly concentrate (without becoming distracted) on the area of reading-skill development targeted for deliberate practice?
- In what manageable ways can my colleagues and I integrate opportunities for deliberate practice across the reading curriculum?
- How responsive are students to teacher comparisons of reading-skills development to the ongoing practice that famous athletes, singers, or musicians engage in to become experts?

8.2.2 Motivation

Additional action research questions centered on student motivation, interests, and attitudes include the following:

- To what extent will reluctant student readers become more motivated to read by charting their progress on individual student record-keeping sheets?
- To what degree does student motivation increase when students are given the opportunity to select some of their own readings?

- What kinds of classroom print displays (to create a print-rich classroom environment) attract the largest numbers of students?
- How effective am I in creating a supportive, nonjudgmental, and constructive atmosphere in my reading lessons?
- Which instructional activities work best to motivate the majority of my students?
- *Which supplementary topics motivate my students to read more?
- *What are students' attitudes toward reading?

8.2.3 Vocabulary

Additional action research questions related to vocabulary include the following:

- How can I free students from an over-dependence on online dictionaries or digital translation tools?
- Which vocabulary learning strategies do students use? (See, e.g., Schmitt & Schmitt, 2005, Chapter 20, for questionnaire ideas; see also Coxhead, 2006.)
- Which glossing procedure leads to better vocabulary retention: glossing in the students' L1 or L2?
- *How effective are vocabulary glosses in assisting students' text comprehension?
- To what extent and how are collocations covered in mandated instructional materials?
- What is an effective way to help students learn and be able to use high-frequency words?
- How can the use of electronic corpora (like MICASE) be incorporated into the teaching of vocabulary?

8.2.4 Discourse Organization and Discourse Structure Awareness

Additional questions related to discourse organization include the following:

- How can I help students learn to notice and use prominent text features (e.g., titles, subtitles, captions, headings, and illustrations) to orientate themselves to texts? To locate important information? To predict text content?
- What are the benefits of focusing on text organization as part of *pre*-reading, *during*-reading, and *post*-reading activities?
- How can I train myself to become more aware of text structure and discourse organization so that I can integrate these important elements of reading into instruction?
- What previewing techniques are most effective in guiding students to identify key words that signal text structure?
- To what extent does the use of scrambled sentences and paragraphs assist students in understanding discourse organization conventions?

- To what extent do cloze passages, with signal words removed, assist students in learning the meaning and function of different signal words?
- *How well can I guide my students in understanding the structural meanings of graphic organizers to improve their comprehension?

8.2.5 *Reading Fluency*

Additional questions related to reading fluency include the following:

- To what extent do fluency activities implemented in class satisfy Nation's (2009) four conditions for fluency-development activities: (a) learners are focused on the message, (b) material is easy, (c) there is pressure to perform at a faster than normal speed, and (d) there is quantity of practice?
- Which fluency task types (Appendix 8-B) are (currently) absent from the course textbook (or curriculum)?
- Which *performance reading* activities (Appendix 8-B) work best in my class?
- When should I integrate recognition exercises—created with key words from assigned passages—into reading lessons: *before* or *after* students read a passage?
- Which students make greatest progress on fluency development, those who regularly engage in timed readings, word recognition exercises, or timed flashcard activities?
- *Which of my students have difficulties with rapid word recognition?
- *What classroom procedures work most effectively for the teacher when implementing a particular reading fluency activity?

8.3 Conclusion

In this chapter, we have presented six model action research projects that center on reading as it relates to deliberate practice, motivation, vocabulary, discourse organization, and fluency. Action research projects on these broad areas are virtually limitless. We hope that the action research plans proposed and research questions posed serve as useful springboards for teacher-initiated action research that will satisfy individual teacher interests, curiosity, and needs (McCardle, Chhabra, & Kapinus, 2008).

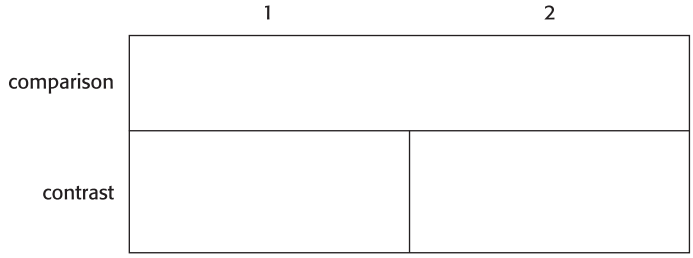
Quote 8.5

> The use of inquiry in gathering and using data at the classroom level parallels what researchers do. For example, teachers have an idea of what instructional technique might work in the classroom, and that idea is based on prior experience, prior successes or failures, and what they have read and learned. Teachers formulate an instructional technique, try it out, and then both observe and measure student responses to have some indication of whether the technique worked, how well it worked, and for which students.
>
> McCardle, Chhabra, and Kapinus (2008, p. 15)

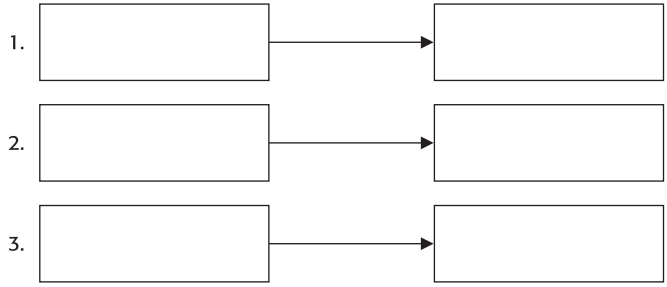
Appendix 8-A: Examples of Discourse Structure Graphic Organizers

1) Definitions

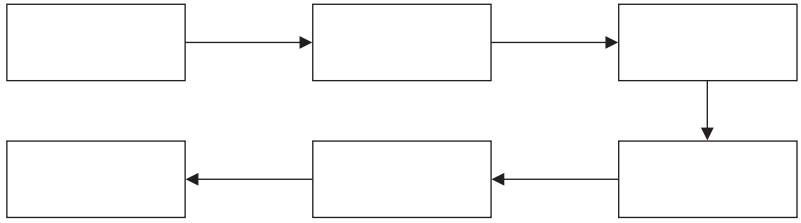
2) Comparison–contrast



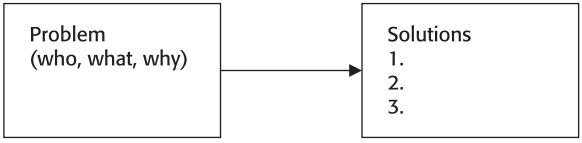
3) Cause–effect (in any number as is needed)



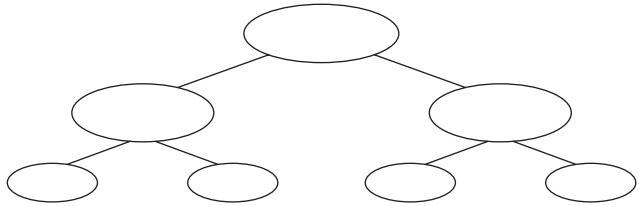
4) Process/Sequence



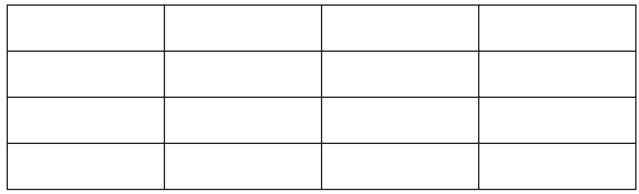
5) Problem–solution (in any number as is needed)



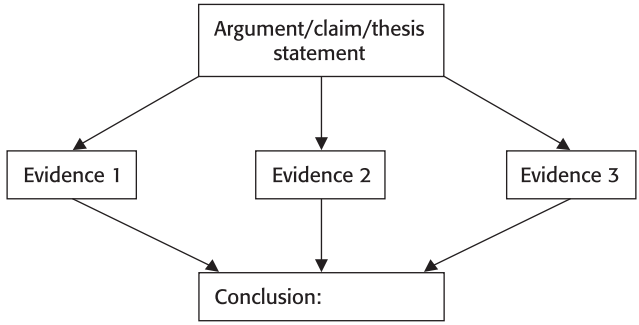
6) Description/classification



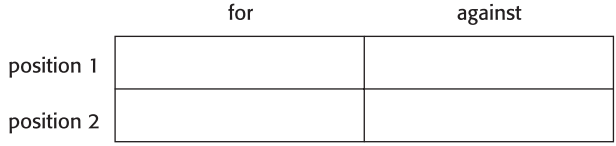
or



7) Argument



8) For–against (cf. comparison–contrast)



9) Timeline

Adapted from Jiang & Grabe, 2009, pp. 36–38.

Appendix 8-B: Sampling of Reading Fluency Activities

Instructional Techniques to Promote Reading Fluency	*General Procedures*	*References*
Recognition Exercises	• Word recognition—Students look at key words and then quickly glance at a set of four to five words that look similar to locate the exact match. Students time themselves and calculate accuracy (see Figure 6.4). • Phrase recognition—Students look at key phrases and then quickly glance at a set of four to five phrases that look similar to locate the exact match. Students time themselves and calculate accuracy (see Figure 6.5). • Word–synonym matching—Students match key words with synonyms within a set time limit. Students follow the same procedures two more times, with a scrambled set of the same words and synonyms and with more restrictive time limits (see Figure 6.7).	Crawford, 2005; Rasinski, 2010; Stoller, 2012
Reading Rate Activities	• Shadow reading—Sequence of tasks in which students listen to a passage on CD (or read aloud by the teacher); students discuss what they've heard; students read the same passage silently while they listen to the CD again; students read aloud quietly with the CD; students answer comprehension questions. • Rate buildup—Students read as much material as they can in 60 seconds; they read the same material three more times, for 60 seconds each round, with the goal of reading further in the text while comprehending the text. • Repeated reading (assisted and unassisted)—Students read a short passage repeatedly until they achieve a (preset) reading rate and comprehension goals. • Class-paced reading—Class reads at a predetermined pace maintained by the teacher. • Self-paced reading—Students read at a self-determined pace. Students calculate how much should be read in a 60-second period at this rate and then mark off five to seven text segments that should be read, one each minute, at students' set WPM.	N. J. Anderson, 2009; Cohen, 2011; Gorsuch & Taguchi, 2008, 2010; Gorsuch, Taguchi, & Umehara, 2015; Kuhn & Levy, 2015; Lynn, 2018; Pytash & Calabria, 2013; Rasinski, 2010; Rasinski, Blachowicz, & Lems, 2012; Taguchi, Gorsuch, Takayasu-Maass, & Snipp, 2012; Wilfong, 2013

(*Continued*)

Appendix 8-B Continued

Instructional Techniques to Promote Reading Fluency	*General Procedures*	*References*
Oral Supported Reading	• Teacher read aloud—Students read silently while a teacher or tutor reads aloud. • Student read aloud—Students read aloud (as a class or in choral groups) along with the teacher, tutor, or a recording of the text. • Echo reading—Two readers—one more proficient than the other (e.g., student–teacher, student–tutor, student–student)—take turns reading together, one sentence or phrase at a time. The weaker reader (the second reader) echoes back the sentences or phrases read by the more proficient reader. • Buddy reading—Two readers at similar levels negotiate how they will orally read the text together (e.g., alternate pages, chorally, one page at a time in echo fashion). Readers stop periodically to talk about what they have read (similar to Partner reading). • Cooperative repeated reading— Students work in pairs. Student reads passage aloud to partner three times; partner offers assistance when necessary. Then students reverse roles. • Paired reading—More able readers help less able readers develop better reading skills. • Oral paired re-reading—See Model Action Research Project 8.1.6.	Kuhn & Levy, 2015; Morgan, 2013; Nation, 2009; Paige, 2013; Rasinski, 2010; Rasinski & Cheesman Smith, 2018; Rasinski & Padak, 2013b; Topping, 2012
Performance Reading	• Radio reading—Students read aloud an assigned portion of a text sounding as much like a professional radio announcer as possible. • Readers' Theater—Students stand in front of classmates and read from scripts. Readers use their voices to bring the script alive. Readers practice scripts many times before performing for their peers. • Reading and performing poetry—Students read poetry aloud to others (after many practice sessions), communicating meaning in their oral interpretations.	Baer, 2013; Keehn, Harmon, & Shoho, 2008; Kuhn & Levy, 2015; Lems, 2013; Rasinski, 2010, 2011; Vasinda & McLeod, 2013; Young, 2013; Young, Valadez, & Gandara, 2016

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The following additional citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Discourse organization*, see http://community.wvu.edu/~xijiang/; www.carla.umn.edu/cobaltt/modules/strategies/gorganizers/index.html.
- *Fluency*, see Rasinski and Padak (2012, 2013a).
- *Researching motivation*, see Woodrow (2015).
- *Vocabulary*, see Ogle, Blachowicz, Fisher, and Lang (2016), www.lextutor.ca/ (Tom Cobb's Compleat Lexical Tutor).
- *Vocabulary and fluency*, see www.victoria.ac.nz/lals/staff/paul-nation/nation.aspx (Paul Nation's home page with links to many vocabulary and reading-fluency resources).

9 Action Research Projects
Set II

As in Chapter 8, here we introduce six model action research projects related to a subset of the curriculum-design principles and teaching practices introduced in Chapters 5 and 6. The focal points of these action research projects are (a) strategic-reader training, (b) main idea comprehension, (c) the pre-, during-, and post-reading lesson format, and (d) digital literacy. Of particular interest are the following

- Model action research projects that can be easily adapted by interested teachers.
- Steps that teachers can follow (likely with some adaptation) to carry out classroom-based action research (as introduced in Chapter 7).
- Easy-to-use data collection instruments.
- Additional research questions related to each focal area that can guide other meaningful action research projects.
- Teaching ideas that can be adapted for classroom use to promote reading skills development.

In this chapter, we describe six model action research projects that highlight different aspects of L2 reading instruction, research questions, and action research plans. This set of model action research projects, like those in Chapter 8, represent just a sampling of the types of action research projects that teachers can engage in to better understand L2 reading, their teaching of reading, their students, and the materials that they use in their classrooms. The model projects build upon (a) curriculum principles 8, 9, 10, and 12 introduced in Chapter 5 and (b) teaching ideas introduced in Chapter 6 that center on strategic-reader training; main idea comprehension; the pre-, during-, and post-reading lesson format; and digital literacy.

We approach the model projects in this chapter (Table 9.1) in the same way that we did those in Chapters 7 and 8. That is, the projects described here should be treated as flexible models, rather than rigid templates, that can be adapted in small or large ways for different instructional settings. Our explanations of

Table 9.1 Model Action Research Projects (Set II)

Model Action Research Project	*Topic*	*Primary Way(s) to Collect Data*
9.1.1	**Strategic-Reader Training**: Teacher think alouds for the modeling of strategic reading	Document gathering (teacher think-aloud scripts) and journal
9.1.2	**Strategic-Reader Training**: Classroom characteristics that support strategic-reader behaviors	Self-observation (with worksheet filled out by the teacher)
9.1.3	**Main-Idea Comprehension**: Questioning the Author (QtA) to promote main-idea comprehension	Self-observation (with mobile phone recordings) and record-keeping form that lends itself to teacher reflection
9.1.4	**Pre-, During-, and Post-Reading Lesson Framework**: During-reading tasks	Case study (of one or more student pairs) and teaching log
9.1.5	**Pre-, During-, and Post-Reading Lesson Framework**: Teacher supplementation of textbook post-reading questions	Document gathering (lesson plans with post-reading questions coded)
9.1.6	**Digital Literacy:** Determination of students' academic digital-literacy needs	Survey (of teacher colleagues) and follow-up focus groups

these model action research projects focus on the first three steps of the eight-step framework introduced in Chapter 7: purpose and area of interest (Step 1), key research question (Step 2), and action research plan (Step 3). We hope that teachers who read over these model projects (and the additional research questions listed at the conclusion of the chapter) are inspired to pursue action research on their own (or with colleagues), using these models as springboards for implementation (see Mills, 2018; Nunan, 1993).

Quote 9.1

> Action research … represents what I would call an "inside out" approach to professional development. It represents a departure from the "outside in" approach (i.e. one in which an outside "expert" brings the "good news" to the practitioner in the form of a … workshop or seminar). In contrast, the inside out approach begins with the concerns and interests of practitioners, placing them at the centre of the enquiry process. In addition to being centred in the needs and interests of practitioners, and in actively involving them in their own professional development, the inside out approach, as realised through action research, is longitudinal in that practitioners are involved in medium to long-term enquiry.
>
> Nunan (1993, p. 41)

9.1 Model Action Research Projects

Quote 9.2

> The ultimate payoff for teacher researchers who have stuck with the process, have learned and internalized … action research skills, and are now committed to action and self-renewal is the belief and knowledge that the real beneficiaries of your work are the students in your care.
>
> Mills (2018, p. 236)

9.1.1 Teacher Think Alouds for Modeling Strategic Reading

Purpose and area of interest: There is evidence that teachers can raise students' awareness of reading strategies and how they work together by verbalizing the strategic behaviors of good readers while reading passages aloud to the class (Wilhelm, 2012). Think-aloud scripts, planned ahead of time, include teacher verbalizations of reading strategies embedded into reading passages. The sample teacher think aloud in Table 9.2 illustrates how a teacher verbalizes [in italics and brackets] common reading strategies while students follow along silently with the textbook passage.

By means of this type of teacher modeling, the strategies used by skilled readers are made explicit for the class. Think alouds make "invisible processes visible to students" (Wilhelm, 2012, p. 11). Sadly, few teachers are trained to write think-aloud scripts and then read them aloud effectively to the class. This model action research project focuses on the writing of think-aloud scripts (an important skill to develop because think-aloud scripts are rarely, if ever, included in textbook manuals). It could easily be done with one or more other teachers. One outcome of an action research project of this type is teachers who become skilled in creating think-aloud scripts, which can later be integrated into classroom instruction to raise students' consciousness about skilled-reader strategies.

Key research question: **How can I develop the skills needed to write think-aloud scripts (with planned verbalizations of reading strategy use) for the reading passages to be assigned to my students?**

Action Research Plan:

Where? Outside of class (at home, at school).

Who/What (to focus on)? Teacher ability to write think-aloud scripts.

What (data to collect)? Think-aloud scripts (written by the teacher researcher or a team of teacher researchers).

How? How often? How long? This action research project entails (a) teacher think-aloud preparation and (b) teacher reflection on the process

Table 9.2 Sample Teacher Think Aloud to Model Strategic Reading, Used with a Reading Passage from Savage (2010, pp. 35–36)

An Ocean of Plastic

[The title, An Ocean of Plastic.[1] *Hmm. I know what plastic is,*[2] *but what is "an ocean of plastic"?*[3] *Oh, the map under the title shows the Pacific Ocean.*[4] *I'll read ahead.*[5]] A big part of the Pacific Ocean is choking on a huge sea of plastic garbage. [*Well, we know that the Pacific Ocean is really large,*[6] *so maybe there is a lot of plastic in the ocean.*[7] *I wonder what choking means*[8]*; I'll look it up later in my dictionary, if I can't figure it out on my own.*[9]] Some scientists think it's as large as the United States, but almost no one noticed it until 1997. [*OK, this says that there is a LOT of plastic in the ocean, as big as the U.S.*[10] *That's terrible.*[11] *Why didn't anyone know about this earlier?*[12]] Then an adventurer named Charles Moore made a shocking discovery, and scientists learned the ugly truth. [*"Ugly truth" sounds bad.*[13] *I wonder what problems the ocean of plastic has created.*[14] *I imagine that the author will tell us.*[15]]

Adapted from Grabe & Stoller, 2018, p. 58.
The teacher think aloud is italicized; the textbook reading passage excerpt is in regular font. Superscripts indicate the strategies being modeled: [1]previewing; [2]connecting text to background knowledge; [3]posing questions; [4]previewing; [5]planning; [6]connecting text to background knowledge; [7]forming predictions; [8]posing questions, monitoring comprehension; [9]using the dictionary; [10]summarizing; [11]inferencing; [12]posing questions; [13]inferencing; [14]posing questions; [15]forming predictions.

to facilitate the writing of future think alouds. The plan is to devise a think-aloud script for at least one reading passage (or excerpt) for each major instructional unit. The teacher researcher selects a passage of potential interest to students that has some element of challenge. The teacher writes up the think-aloud script to model strategies that lend themselves to the passage. (See Appendix 5-B for a list of common strategies; see Moss & Loh-Hagan, 2016, pp. 132–137, for phrases that teachers can embed into their think alouds to signal different strategies.) Wilhelm (2012) suggests that teachers begin with the strategies that "successful readers use every time they read" (p. 37); these include activating background knowledge, personally connecting to content, establishing a purpose for reading, making predictions, visualizing what is being read, asking questions (i.e., interrogating the text), summarizing, monitoring comprehension, and self-correcting, when needed.

The teacher researcher engages in a cycle of (a) reading over textbook passages (to be assigned) to identify the strategies that students might use to achieve comprehension (with Appendix 5-B in hand), (b) writing out verbalizations that model the strategic thinking of a skilled reader of challenging texts, with vocabulary that is easily understood by learners and that makes the target strategy transparent, and (c) jotting down notes, in a journal, about aspects of the process that led to strategy selections and the writing of verbalizations.

Additional comments: A logical follow-up action research project could focus on the teacher's ability to read the scripts aloud to the class and engage students in discussions of modeled strategies. (See Moss & Loh-Hagan, 2016; Wilhelm, 2012, for the various ways teachers can use think alouds; see also Grabe & Stoller, 2011, Chapter 8, Section 8.1.3, for another action research project on teacher think alouds.)

9.1.2 Classroom Characteristics That Support Strategic Reader Behaviors

Purpose and area of interest: Reading instruction that emphasizes strategic reading behaviors frequently includes certain supportive characteristics (e.g., Almasi & Fullerton, 2012; Dougherty Stahl, 2013; Mokhtari & Sheorey, 2008; Swan, 2003). Determining the extent to which we incorporate these features (Table 9.3, left-hand column) can be insightful for our teaching. At the end of a project like this one, teacher researchers have a better sense of the degree to which their instruction supports the development of strategic reading behaviors. Based on this understanding, teachers should be able to enhance the ways they teach to create a classroom environment conducive to effective strategy instruction.

Key research question: **To what extent am I supporting the development of students' strategic reading behaviors?**

Action research plan:

Where? In class.

Who/what (to focus on)? Teacher incorporation of classroom characteristics that support strategic reading.

What (data to collect)? Self-observation (with teacher worksheet).

How often? How long? At the end of every class session that has some reading element, for the duration of one entire thematic unit (or one month, or one semester), the teacher researcher evaluates the extent to which the development of strategic reading behaviors is being supported in class. A worksheet (like the one in Table 9.3) is used to track and comment on supportive practices for each class being reflected upon. Even in the midst of this action research project, teacher researchers can modify their teaching practices when it becomes apparent that they are neglecting certain aspects of strategic reading classrooms.

Additional comments: Upon completion of data collection, the teacher researcher reviews her worksheets to identify supportive practices used on a regular basis as well as neglected aspects of strategic reading classrooms. The teacher researcher pays special attention to written comments (in the right-hand column of the worksheet) because they may reveal how teacher approaches to strategic reading change over time. The results of worksheet analyses may shed light on which classroom practices should be continued and what types of modifications could be made to support strategic reading behaviors in future classes.

Table 9.3 Teacher Worksheet to Keep Track of Class Characteristics That Support Strategic-Reading Behaviors

Teacher Worksheet

Date: _____ *Class:* _____

Class Characteristics That Support Strategic Reading Behavior	*Presence of Characteristic*		*Observations/Comments*
1. The teacher takes time to determine if students are aware of the reading strategies that they use when reading.	Yes	No	
2. The teacher introduces specific reading strategies that assist students in achieving reading comprehension goals and then explains *why* they are important, *how* they are used, and *when* they are used.	Yes	No	
3. Students discuss *which* strategies they used or will use, *why* they are important, *how* they are used, *when* they are used, and *if* they proved useful for reading comprehension.	Yes	No	
4. The teacher reads aloud while verbalizing reading strategies (with scripted think alouds) to model expert reading behaviors.	Yes	No	
5. As part of guided practice, students are encouraged to use and practice meaningful (rather than rote) combinations of strategies with authentic and purposeful tasks.	Yes	No	
6. Students are given opportunities for independent practice, after sufficient guided practice (thereby applying a gradual release of teacher responsibility).	Yes	No	
7. Students receive forward-looking feedback on their strategy use.	Yes	No	
8. Students are reminded of the benefits of strategy use and are asked to explain how they use strategies to process texts.	Yes	No	
9. The teacher engages students in discussions about *how* they understand more difficult parts of texts.	Yes	No	
10. The teacher lists strategies introduced and practiced in a visible classroom location (e.g., on a poster or wall chart) for easy student consultation (especially during classroom discussions).	Yes	No	
11. The teacher targets a specific number of key comprehension strategies (e.g., 10–12) and guides students in mastering them during a semester or school year.	Yes	No	
12. The class has a content base; students use strategies while reading to learn interesting content.	Yes	No	

Quote 9.3

> Skilled readers don't get that way over night. They learn how to become strategic by engaging in reading over long periods of time, with lots of different texts, and with lots of opportunities to practice. They practice applying strategies, monitoring their processes and evaluating the effectiveness of different strategies for themselves in different reading situations, with teachers explaining and modeling the use of a wide variety of strategies.
>
> Adapted from Mokhtari and Sheorey (2008, p. 224)

9.1.3 Questioning the Author to Promote Main-Idea Comprehension

Purpose and area of interest: Instructional approaches that involve the teacher *and* students in forming and answering questions about the text can promote the development of main-idea comprehension. The Questioning the Author (QtA) approach (e.g., Beck & McKeown, 2006; Beck & Sandora, 2016a; see also Raphael, George, Weber, & Nies, 2009) is unique in that questions are directed to the "invisible author." With this approach, questions not only address text comprehension and monitoring but also may lead to hypotheses about author's purpose, critiques of the author's writing, identification of author bias and tone, an exploration of the significance of the text, and student stance on the usefulness of text information. With this approach, students "develop a dialogue with the author, just as they would with a person talking with them face to face. Students are encouraged to 'query' the author, asking questions that get at a writer/content expert's decisions" (Blachowicz & Ogle, 2008, p. 123).

With an action research project focused on the QtA approach, teacher researchers will gain practice in asking new types of questions that engage students in discussions of text comprehension, author purpose and bias, the significance of the text, and so forth. At the same time, student involvement with the QtA approach will likely result in improved main-idea comprehension abilities, deeper engagement with the text, and (eventually as the question-posing responsibility transfers from teacher to students) the development of relevant question-posing abilities.

Key research question: **Which questions, typical of the Questioning the Author approach, evoke good student responses? Which questions lead to high levels of student engagement in discussions of text comprehension?**

Action research plan:

Where? In class.

Who/What (to focus on)? Teachers' questions and responses from individual students and the whole class.

What (data to collect)? Self-observation with mobile phone recordings and a record-keeping sheet that accommodates teacher reflection and commentary.

Table 9.4 Questions Typical of the Questioning the Author (QtA) Approach

1. What is the author trying to say?
2. What is the author's goal? What is the author's message?
3. Why does the author choose to include this information or these details?
4. Do you think the author's message is clear? Why? Why not?
5. How could the author say this more clearly?
6. What types of examples could have been added to strengthen the author's position?
7. Do the author's examples help or create confusion?
8. What does the author want us to think at this point?
9. How does the author signal main ideas?
10. How clear are the author's main ideas?
11. Did the author give us the answer to the issue that s/he has raised?
12. What biases or perspectives does the author reveal?
13. What is the significance of the author's message?

How? How often? How long? Before data collection begins, the teacher researcher becomes familiar with the QtA approach (see previous *purpose* section for references) and writes out a set of sample QtA questions (Table 9.4), adapted to students' language abilities. While lesson planning, the teacher researcher decides which QtA questions are most appropriate for the reading passage assigned and in what order they should be asked. Then during the lessons in which QtA questions are posed, the teacher researcher records the lesson segment (with a recording device). After class, recordings are reviewed and the teacher researcher writes out the questions actually asked during QtA class segments (assuming that the questions might have been modified in response to students' reactions) on a record-keeping sheet (Table 9.5). On the same sheet, the teacher comments on (a) students' responsiveness to the questions, (b) the nature of the class discussion, (c) the extent to which the questions turned out to be relevant to text comprehension, (d) the degree to which the questions obliged students to explore the text, or (e) student engagement with the

Table 9.5 QtA Teacher Record-Keeping Sheet

Questioning the Author (QtA): Record-Keeping Sheet		
Date	*Questions Asked*	*Comments*[a]
	1. What is the author trying to say?	

[a] Comments on, for example, (a) students' responsiveness to the question, (b) the nature of class discussion, (c) the extent to which the question assisted students in text comprehension, (d) the degree to which the question obliged students to explore the text, and (e) student engagement with the reading material.

reading material. This cycle of data collection and reflection continues for five to eight weeks, or long enough to gather enough data to be able to determine which questions (or question types) stimulate active student engagement in exploring the text, the author's purposes for writing, the author's effectiveness, and the significance of the text.

9.1.4 During-Reading Tasks

Purpose and area of interest: Most reading textbooks include pre- and post-reading tasks, but few explicitly guide students in the during-reading stage (Hedgcock & Ferris, 2018). It is not uncommon to see instructions, immediately following pre-reading tasks, that simply direct students to "read the passage." A variety of during-reading tasks can be incorporated into reading lessons to provide students with meaningful during-reading practice with the strategies that skilled readers use while reading to achieve comprehension (see Sections 6.2.2.2, 6.3.2, and Table 6.5; see also Hedgcock & Ferris, 2018). In this action research project, the teacher researcher experiments with different during-reading tasks (at about the halfway point in a reading passage) and observes one or two student pairs as a way to judge the effectiveness of teacher instructions, the logic of task procedures, and student responsiveness.

Key research question: **How do students handle during-reading tasks implemented at about the halfway point in a reading passage?**

Action Research Plan:

Where? In class.

Who/What (to focus on)? During-reading tasks and students' responsiveness to them.

What (data to collect)? Inventory of during-reading tasks and teaching-log notes about one or more student pairs.

How? How often? How long? The teacher researcher assigns a during-reading task (from among those listed in Table 9.6) at the appropriate point in the text (whether it be at the half-way point or at another convenient juncture in the text) while following these general steps:

1. Ask students to stop reading.
2. Assign a during-reading task that students complete individually.
3. Ask students to compare answers with a classmate.
4. Engage students in a whole-class discussion of answers, accompanied by clarification requests, when appropriate.
5. Direct students to continue reading for a well-defined purpose.

While students are working in pairs (Step 3), the teacher observes one or two focal pairs to determine how they interpret the task and how they proceed in comparing answers. The teacher jots down informal notes during observations of student pairs (in a teaching log) that will assist in the "reconstruction" of what has occurred when the teaching log is reviewed

Table 9.6 During-Reading Task Options, To Be Used Halfway through the Text or at Another Convenient Text Break

After students have gotten to about the halfway point in a reading passage or at another convenient juncture, the teacher directs students to engage in one or more of the following during-reading tasks:

(1) List the three most important points from the text.
(2) Consider whether predictions made during the pre-reading stage of the lesson have been met; make new predictions about the next part of text.
(3) Fill in a partially completed outline of the first part of the text.
(4) Complete a graphic organizer that is reflective of the first part of the text or some specific paragraph (e.g., a timeline for a chronological text, a Venn diagram for a compare and contrast passage).
(5) Match statements, across columns, that illustrate relationships introduced in the text (e.g., cause–effect, problem–solution, fact–opinion, pros–cons, stated–inferred).
(6) Complete a true–false task about the text.
(7) Write a summary to that point in the text.
(8) Write two questions that you hope or expect will be answered in the next part of the text.
(9) Identify five vocabulary items: two that you understand and perceive to be critical for text comprehension; three that you don't understand but that you perceive as important for text comprehension.
(10) Distinguish between main ideas and supporting details.
(11) Compare what has been read with what is known.
(12) Evaluate the value of text information.

later. The aim is to gain insights that lead to improvements in instructions, procedures, or follow-up with students.

Additional comments: When lesson planning, the teacher researcher should adopt (or adapt) a during-reading task that complements the assigned text. If students have had no experience with the during-read task that is to be investigated, the teacher should model the task (just as teachers do with all new classroom activities and procedures) before data collection begins.

Quote 9.4

> The goal of the during-reading phase … is to ensure thorough comprehension of the text under consideration, and … to develop effective and transferable reading strategies that students can use for future reading assignments in and beyond reading or language instruction.
>
> Hedgcock and Ferris (2018, p. 192)

9.1.5 *Teacher Supplementation of Textbook Post-Reading Questions*

Purpose and area of interest: It should come as no surprise to reading teachers that there is often the need to supplement textbooks to make up for their shortcomings (N. J. Anderson, 2008). Teachers often devise their

own post-reading questions and tasks to enhance textbooks that do not include or have inadequate post-reading activities. Reading teachers also write post-reading questions for the supplementary reading passages that they bring into class to enrich the reading curriculum. For the sake of expediency, teachers sometimes pose simple yes–no and short-response questions to check students' text comprehension. Unfortunately, this approach to checking reading comprehension (a) robs the teacher of a realistic assessment of students' reading abilities and (b) cheats students of developing their reading and critical thinking abilities and, possibly more importantly, the experience of having to be accountable for their reading and responses. As part of this action research project, the teacher researcher gains experience writing new types of post-reading questions, which lead to a range of possible outcomes (see Table 9.7).

One valuable result of this action research project is the teacher researcher's enlarged repertoire of post-reading question types that can be used during reading lessons. With the goal of posing questions that require more than yes–no and short-answer responses, the teacher researcher writes post-reading questions that encourage critical thinking and the development of various post-reading skills and strategies.

Key research question: **What new types of post-reading questions can I (by myself or with colleagues) write to supplement the textbook?**

Action research plan:

Where? In lesson planning location.

Who/What (to focus on)? Post-reading questions written by the teacher

What (data to collect)? Lesson plans (with post-reading questions coded, according to Table 9.7).

How? How often? How long? Before class, the teacher researcher (by herself or himself or with colleagues) writes text-appropriate post-reading questions that oblige students to go beyond yes–no and short-answer responses (Table 9.7). The questions and the original intention of each question are indicated in lesson plans, the latter indicated with a code from Table 9.7 (e.g., C = critique; H = infer).

Additional comments: A follow-up action research project could entail taping students' responses to the questions, with the goal of determining how students handle and interpret the questions. Lesson plans (with teacher-generated questions and their alphabetic codes) in addition to taped student responses would serve as primary data sources. When analyzing data, the teacher researcher connects each question asked to corresponding student responses to determine if students interpreted questions as originally intended. When there is a mismatch between teacher intentions and students' responses (e.g., students provide a summary in response to a question meant to elicit a prediction), the teacher considers the reasons for the mismatch. Was there a particular lexical item that might have been misunderstood? Was teacher intonation misleading? How could the question be modified to get the desired response? The consideration of such issues (a) helps the teacher understand the impact that post-reading

Table 9.7 Post-Reading Question Emphases and Intended Outcomes

Lesson Plan Code	*Intended Emphasis & Outcome of Post-Reading Questions*	*Sample Questions*
A	Apply	How can the author's solutions be used to solve our own community's traffic problems?
B	Connect	How does this discussion of uranium mining connect to the video we saw on coal mining? to the newspaper article we read on solar energy?
C	Critique author or text	Has the author persuaded you of her position? Do you agree or disagree with the author's position? Why?
D	Evaluate/judge	In your opinion, what are the strengths and weaknesses of wind power?
E	Expand	What qualities do you want in a new president?
F	Explain	Why was the concert canceled?
G	Identify a detail	Name two ways that you can recycle plastic bags.
H	Infer	What do you think the hitchhiker is carrying in his bag? Why?
I	Integrate	Based on what you learned in Chapters 1 and 2, what is the ideal job?
J	Interpret	What is the worst thing about being a brain surgeon?
K	Personalize	What is the housing situation in *your* country?
L	Predict	What do you think is going to happen next?
M	Restate	What did the author say about flying on trans-Atlantic flights?
N	Revisit pre-reading expectations	Were our original predictions about this reading correct? Explain.
O	Summarize	What is the main idea of this passage?
P	Other	

questions have on reading lessons, (b) raises teacher consciousness about post-reading questioning options, and (c) assists the teacher with the writing of questions for future lessons. Students, of course, are the ultimate beneficiaries of this action research project.

Quote 9.5

> Teachers should be aware that a single classroom textbook will not meet the needs for both intensive and extensive instruction. Materials will need to be selected [and/or developed] that engage the learners in both types of reading.
>
> N. J. Anderson (2008, p. 9)

9.1.6 Determination of Students' Academic Digital-Literacy Needs

Purpose and area of interest: Instructors in secondary- and tertiary-level settings can safely assume that their students read some combination of print and online materials. Academic success, in many settings, now requires skilled reading with both types of texts. Yet, despite students' comfort levels with some forms of digital literacy, their digital-literacy skills are typically not the types needed for academic success (Coiro, 2015; Dobler & Eagleton, 2015). Because few English-language curricula or L2 reading textbooks adequately prepare students for the digital reading that they will encounter as they advance in their studies, teachers need to find ways to integrate digital texts and digital-literacy training into instruction. Before selecting digital texts for instructional purposes, a first step could be to survey colleagues about students' digital-literacy needs. A second step could entail focus-group discussions with colleagues to consider students' digital literacy needs, the types of digital texts to adopt (or adapt), and the sequencing of digital-literacy training.

Quote 9.6

> Once considered ancillary, [Web reading] is now essential in school, at home, and in the workplace, as people use online information to learn, solve problems, answer questions, and participate in a digital society.
>
> Dobler & Eagleton (2015, pp. 2–3)

Key research question: **What do teacher colleagues perceive as students' most critical needs in relation to digital literacy for academic purposes?**

Action research plan:

Where? At school (e.g., in the teacher's workroom) or with an online survey.

Who/what (to focus on)? Teachers' perceptions of students' digital-literacy needs.

What (data to collect)? Survey data and focus-group deliberations.

How? How often? How long? The action research project proposed here is likely to be the first in a series. The first step entails surveying teacher colleagues to ascertain their perceptions of students' academic digital-literacy needs (Table 9.8). The results of the survey and follow-up focus-group discussions could lead to decisions about program-wide digital-literacy priorities and digital-text selection.

Additional comments: Subsequent action research projects could focus on digital text selection (adoption or adaptation), the development of instructional support materials to accompany digital texts, and students' responsiveness to digital texts chosen for instruction, to name just a few of the possibilities.

9.2 Additional Questions to Guide Action Research

The four areas explored in this chapter—strategic reader training, main idea comprehension, reading-lesson stages, and digital literacy—have the potential

Table 9.8 Teacher Survey to Determine the Digital-Literacy Needs of Students with Academic Aims

Dear colleagues:

Consider the following digital-literacy skills that are needed by our students for academic success. I'm thinking that it is time we update our reading curriculum to address these skills. But where should we start? You can help me by completing the survey.

Please rank order the digital-literacy skills, with our students in mind, from most critical (1) to least critical (8). If you can think of other academic digital-literacy skills that our students would benefit from, jot them down in the space provided.

Please indicate if you'd be willing to meet with me to brainstorm ways to integrate digital-literacy skill development and digital texts into our curriculum.

Thank you!

Ranking (1-8) Digital Literacy Skills[a]

__Navigating the convoluted pathways inherent in online searches
__Locating academically relevant information
__Reading online sources critically
__Determining the importance of information
__Judging the accuracy, reliability, and bias of online sources
__Determining authorship
__Making connections within and across digital texts
__Using online information responsibly for written assignments

Other academic digital literacy skills needed by our students:

Would you be willing to meet with me to brainstorm ways to integrate digital literacy skills development and digital texts into our reading curriculum? YES NO

Name_____ Contact information_____

[a] Drawn from Dobler and Eagleton (2015).

for countless action research projects. We list a few additional action research questions here that might spark teacher researchers' interests. The best questions, of course, are those that help teachers understand the effectiveness of their own teaching, the usefulness of certain teaching techniques, student responsiveness to different classroom procedures, student grasp of materials, and so forth. (Note: asterisks indicate model action research projects described in Grabe & Stoller, 2011.)

9.2.1 Questions Related to Strategic Reader Training

Additional questions related to strategic reader training include the following:

- What are effective ways to engage students in discussions of *which* strategies they use, *when*, *how*, and *for what purpose*?
- How well do I incorporate student self-reflection into the end of reading lessons to raise students' awareness of strategy use?
- How helpful do students think "monitoring reading strategies" are (i.e., monitoring main-idea comprehension, identifying difficulties, taking steps

to repair faculty comprehension, judging how well objectives are met, re-reading, reflecting on what has been learned)?
- Which strategies help students make sense of densely written texts?
- How can group tasks, rather than individual student tasks, contribute to effective strategy instruction?
- How can L1 skills and strategies become positive support for L2 reading development?
- *To what extent do my students use common reading strategies?

9.2.2 Questions Related to Main-Idea Comprehension

Additional questions related to main-idea comprehension include the following:

- What kinds of oral and written summary activities can I use to promote main-idea comprehension?
- How can I use follow-up *why* questions to promote main-idea comprehension (as advocated by the Elaborative Interrogation approach, e.g., Ozgungor & Guthrie, 2004; see also footnote 6 in Chapter 6)?
- What are the most effective ways to activate students' prior knowledge to improve their main-idea comprehension?
- What steps do I take when prior-knowledge activation activities backfire, that is, result in information that is incompatible with the text?
- What teaching techniques are effective for guiding students in identifying their own goals for reading (an important first step in reading)?
- It is often said that inferencing abilities represent a major difference between poor and strong readers (Grabe, 2009). Is this true in my class?
- *Which grammatical structures in assigned reading materials, if any, merit instruction, particularly as grammar-awareness-for-comprehension activities?

9.2.3 Questions Related to Reading-Lesson Stages

Additional questions related to reading-lesson stages include the following:

- How can I integrate graphic organizers into pre-reading (or during-reading, post-reading) tasks?
- What role(s) do I assume during post-reading discussions: guide, model, or facilitator of success (see Section 6.3.2)?
- Which stages of a reading lesson are best served by group work?
- What goals am I fulfilling in each stage of my reading lessons (Table 6.5)?
- How can I build student interest in readings that are not inherently interesting to them initially?
- How can I integrate text highlighting, marginal notes, outlining, and note-taking into the during-reading segment of my classes?
- *What kinds of pre-reading activities do I use? Which ones seem to work well? Which don't seem to work well?

9.2.4 Questions Related to Digital Literacy

Additional questions related to digital literacy include the following. The first question is a possible follow up to Model Action Research Project 9.1.6.

- Which digital texts can be adopted (or adapted) to address one or more of these digital literacy challenges: determining authorship; judging the accuracy, reliability, and bias of online sources; locating academically relevant information; making connections within and across digital texts; navigating the convoluted pathways inherent in online searches; using online information responsibly for written assignments?
- How can I train students to "cope with the clutter of extraneous information on an online dictionary page" (Cobb, 2017, p. 314)?
- What kinds of digital literacy training tasks lend themselves to students using their own mobile phones to accomplish the tasks?
- Many digital texts permit students to look up the meaning of unfamiliar words with a click of a button. Do students benefit from looking up the words *while* reading (potentially disrupting the flow of reading) or *after* having finished the passage?
- What are some ways to supplement the course textbook with digital texts (and accompanying digital literacy training)?
- In which medium—print or digital—are students likely to re-read to improve their comprehension?
- What are some effective teaching techniques for helping students understand the value of good keywords for online searches?

9.3 Conclusion

In this chapter, we have sketched out six action research projects that showcase some of the ways in which reading teachers can investigate select aspects of reading instruction, including strategic-reader training, main idea comprehension, reading-lesson stages, and digital literacy. Action research projects on these broad areas are virtually limitless. We hope that the model projects presented here, as well as the additional research questions listed, motivate teachers to become involved in action research (see Burns, 2010).

Quote 9.7

> Doing [action research] can reinvigorate our teaching, lead to positive change, raise our awareness of the complexities of our work, and show us what drives our personal approaches to teaching.
>
> Burns (2010, p. 7)

Further Reading

Citations that appear in the chapter represent important references for further details about the studies showcased here. The following additional citations provide key information on areas introduced in the chapter. See also Chapter 10.

- *Digital reading*, see Damico and Panos (2016), Kervin, Mantei, and Leu (2018), Zhang and Duke (2008).
- *Good ideas for promoting reading comprehension among advanced academically oriented L2 students*, see Zwier (2010).
- *Pre-, during-, post-reading activities*, see Peregoy and Boyle (2016).
- *Protocols for strategy instruction (e.g., Collaborative Strategic Reading, Concept-Oriented Reading Instruction, Questioning the Author, Reciprocal Teaching, Transactional Strategies Instruction)*, see Almasi and Hart (2019), R. Brown (2008, 2017), Duke and Martin (2019), Wharton-McDonald and Erickson (2017).

Part V
Resources

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10 Resources for Exploring L2 Reading

In this chapter, we list select resources related to the teaching and researching of reading. (Other resources appear in the Further Reading sections of each chapter and in the References section at the end of the volume.) These resources give teachers access to current research on L1 and L2 reading, ideas for reading instruction, and tools for conducting meaningful action research. We have divided the resources into nine sections:

- Journals dedicated to reading and related issues.
- Journals that publish studies related to reading and reading-related topics.
- Journals that periodically include articles related to teaching (and researching) L2 reading.
- Key L1 reading studies described in the 1st edition of *Teaching and Researching Reading* (Grabe & Stoller, 2002).
- Key L2 reading studies described in the 1st edition of *Teaching and Researching Reading* (Grabe & Stoller, 2002).
- Key L1 reading studies described in the 2nd edition of *Teaching and Researching Reading* (Grabe & Stoller, 2011).
- Key L2 reading studies described in the 2nd edition of *Teaching and Researching Reading* (Grabe & Stoller, 2011).
- Open source journals focused on action research.
- Professional organizations of interest to reading researchers and teachers.

10.1 Journals Dedicated to Reading and Related Issues

Journal of Adolescent & Adult Literacy (formerly *Journal of Reading*)
Journal of Extensive Reading
Journal of Literacy Research (formerly *Journal of Reading Behavior*)
Journal of Research in Reading
Language & Literacy: A Canadian Educational E-Journal (online journal)
Literacy Research and Instruction (formerly *Reading Research and Instruction)*

Reading and Writing
Reading & Writing Quarterly
Reading in a Foreign Language
Reading Online (an electronic journal of the International Reading Association)
Reading Psychology
Reading Research Quarterly
The Reading Matrix: An International Online Journal
The Reading Teacher
Scientific Studies of Reading

10.2 Journals That Publish Studies Related to Reading and Related Topics

Applied Linguistics
Applied Psycholinguistics
Australian Review of Applied Linguistics
Canadian Modern Language Review
Elementary School Journal
Journal of Educational Psychology
Language Learning: A Journal of Research in Language Studies
Language Learning & Technology
Language Teaching
Language Teaching Research
Language Testing
Second Language Research
Studies in Second Language Acquisition
System
TESOL Quarterly
The Modern Language Journal

10.3 Journals That Periodically Have Articles Related to Teaching (and Researching) L2 Reading

Applied Language Learning
ELT Journal
English for Specific Purposes
English Teaching Forum
Foreign Language Annals
Internet TESL Journal
Journal of English for Academic Purposes
Prospect: A Journal of Australian TESOL
TESL-EJ (Teaching English as a Second or Foreign Language: An Electronic Journal)
TESL Canada Journal/La Revue TESL du Canada
TESOL Journal
The Language Teacher

10.4 Key L1 Reading Studies Described in Grabe and Stoller (2002)

Beck, I., McKeown, M., Sinatra, G., & Loxterman, J. (1991). Revising social studies text from a text-processing perspective: Evidence of improved comprehensibility. *Reading Research Quarterly*, *26*, 251–276.

Brown, R., Pressley, M., Van Meter, P., & Schuder, T. (1996). A quasi-experimental validation of transactional strategy instruction with low-achieving second-grade students. *Journal of Educational Psychology*, *88*, 18–37.

Carver, R. (1997). Reading for one second, one minute, or one year from the perspective of rauding theory. *Scientific Studies on Reading*, *1*, 3–43.

Cipielewski, J., & Stanovich, K. (1992). Predicting growth in reading ability from children's exposure to print. *Journal of Experimental Child Psychology*, *54*, 74–89.

Guthrie, J., Wigfield, A., Metsala, J., & Cox, K. (1999). Motivational and cognitive predictors of text comprehension and reading amount. *Scientific Studies of Reading*, *3*, 231–256.

Nagy, W., Herman, P., & Anderson, R. C. (1985). Learning words from contexts. *Reading Research Quarterly*, *20*, 233–53.

Perfetti, C., Britt, M., & Georgi, M. (1995). *Text-based learning and reasoning*. Hillsdale, NJ: Lawrence Erlbaum.

Stahl, S. A., Heubach, K., & Cramond, B. (1997). *Fluency oriented reading instruction* (Reading Research Report no. 79). Athens, GA: National Reading Research Center.

Tan, A., & Nicholson, T. (1997). Flashcards revisited: Training poor readers to read words faster improves their comprehension of texts. *Journal of Educational Psychology*, *89*, 276–288.

10.5 Key L2 Reading Studies Described in Grabe and Stoller (2002)

Anderson, N. J. (1991). Individual differences in strategy use in second language reading and testing. *The Modern Language Journal*, *75*, 460–472.

Bell, J. S. (1995). The relationship between L1 and L2 literacy: Some complicating factors. *TESOL Quarterly*, *29*, 687–704.

Carrell, P. L. (1992). Awareness of text structure: Effects on recall. *Language Learning*, *42*, 1–20.

Chen, H.-C., & Graves, M. F. (1995). Effects of previewing and providing background knowledge on Taiwanese college students' comprehension of American short stories. *TESOL Quarterly*, *29*, 663–686.

Elley, W. B. (1991). Acquiring literacy in a second language: The effect of book-based programs. *Language Learning*, *41*, 375–411.

Hazenburg, S., & Hulstijn, J. H. (1996). Defining a minimal receptive second-language vocabulary for non-native university students: An empirical investigation. *Applied Linguistics*, *17*, 145–163.

Kern, R. G. (1994). The role of mental translation in second language reading. *Studies in Second Language Acquisition*, *16*, 441–461.

Muljani, D., Koda, K., & Moates, D. R. (1998). The development of word recognition in a second language. *Applied Psycholinguistics*, *19*, 99–113.

Parry, K. (1991). Building a vocabulary through academic reading. *TESOL Quarterly*, *25*, 629–653.

Schoonen, R., Hulstijn, J., & Bossers, B. (1998). Metacognitive and language-specific knowledge in native and foreign language reading comprehension: An empirical study among Dutch students in grades 6, 8 and 10. *Language Learning*, *48*, 71–106.

10.6 Key L1 Reading Studies Described in Grabe and Stoller (2011)

Byrne, B., & Fielding-Barnsley, R. (1989). Phonemic awareness and letter knowledge in the child's acquisition of the alphabetic principle. *Journal of Educational Psychology*, *81*, 313–321.

Byrne, B., & Fielding-Barnsley, R. (1991). Evaluation of a program to teach phonemic awareness to young children. *Journal of Educational Psychology*, *83*, 451–455.

Byrne, B., & Fielding-Barnsley, R. (1993). Evaluation of a program to teach phonemic awareness to young children: A 1-year follow-up. *Journal of Educational Psychology*, *85*, 104–111.

Byrne, B., & Fielding-Barnsley, R. (1995). Evaluation of a program to teach phonemic awareness to young children: A 2- and 3-year follow-up and a new pre-school trial. *Journal of Educational Psychology*, *87*, 488–503.

Guthrie, J. T., McRae, A., & Klauda, S. L. (2007). Contributions of Concept-Oriented Reading Instruction to knowledge about interventions for motivations in reading. *Educational Psychologist*, *42*, 237–250.

Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap by age 3. *American Educator*, *27*(1), 4–9.

Klauda, S. L., & Guthrie, J. T. (2008). Relationships of three components of reading fluency to reading comprehension. *Journal of Educational Psychology*, *100*, 310–321.

Kuhn, M. R., Schwanenflugel, P. J., Morris, R. D., Morrow, L. M., Woo, D. G., Meisinger, E. B., Sevcik, R. A., Bradley, B. A., & Stahl, S. A. (2006). Teaching children to become fluent and automatic readers. *Journal of Literacy Research*, *38*, 357–387.

McKeown, M. G., & Beck, I. L. (2004). Transforming knowledge into professional development resources: Six teachers implement a model of teaching for understanding text. *The Elementary School Journal*, *104*, 391–408.

Meyer, B. J. F., & Poon, L. W. (2001). Effects of structure strategy training and signaling on recall of texts. *Journal of Educational Psychology*, *93*, 141–159.

Nagy, W., Berninger, V. W., & Abbott, R. D. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of Educational Psychology*, *98*, 134–147.

Pressley, M., Gaskins, I. W., Solic, K., & Collins, S. (2006). A portrait of Benchmark School: How a school produces high achievement in

students who previously failed. *Journal of Educational Psychology*, 98, 282–306.

Snow, C.E., Porche, M. V., Tabors, P. O., & Harris, S. R. (2007). Closing the literacy achievement gap and promoting reading for learning: Two challenges. In *Is literacy enough? Pathways to academic success for adolescents* (pp. 9–25). Baltimore, MD: Paul H. Brookes.

Taboada, A., & Guthrie, J. T. (2006). Contributions of student questioning and prior knowledge to construction of knowledge from reading information text. *Journal of Literacy Research*, *38*, 1–35.

10.7 Key L2 Reading Studies Described in Grabe and Stoller (2011)

Al-Homoud, F., & Schmitt, N. (2009). Extensive reading and a challenging environment: A comparison of extensive and intensive reading approaches in Saudi Arabia. *Language Teaching Research*, *13*, 383–401.

Gorsuch, G., & Taguchi, E. (2008). Repeated reading for developing reading fluency and reading comprehension: The case of EFL learners in Vietnam. *System*, *36*, 253–278.

Horst, M. (2009). Developing definitional vocabulary knowledge and lexical access speed through extensive reading. In Z. H. Han & N. J. Anderson (Eds.), *Second language reading research and instruction: Crossing the boundaries* (pp. 40–64). Ann Arbor, MI: The University of Michigan Press.

Macaro, E., & Erler, L. (2008). Raising the achievement of young-beginner readers of French through strategy instruction. *Applied Linguistics*, *29*, 90–119.

Pulido, D., & Hambrick, D. Z. (2008). The virtuous circle: Modeling individual differences in L2 reading and vocabulary development. *Reading in a Foreign Language*, *20*, 164–190.

Scott, V., & de la Fuente, J. (2008). What's the problem? L2 learners' use of the L1 during consciousness-raising, form-focused tasks. *Modern Language Journal*, *92*, 100–113.

Takase, A. (2007). Japanese high school students' motivation for extensive L2 reading. *Reading in a Foreign Language*, *19*, 1–18.

Taylor. A., Stevens, J., & Asher, J. W. (2006). The effects of explicit reading strategy training on L2 reading comprehension. In J. Norris & L. Ortega (Eds.), *Synthesizing research on language learning and teaching* (pp. 213–244). Philadelphia, PA: John Benjamins.

Wang, M., & Koda, K. (2007). Commonalities and differences in word identification skills among learners of English as a second language. *Language Learning*, *57*, 201–222.

Webb, S. (2009). The effects of pre-learning vocabulary on reading comprehension and writing. *Canadian Modern Language Review*, *65*, 441–470.

10.8 Open Source Journals Focused on Action Research

Action Learning and Action Research Journal (ALAR)
Canadian Journal of Action Research (*CJAR*)
Educational Action Research
i.e.: inquiry in education
Journal of Teacher Action Research (JTAR)
Networks: An On-line Journal for Teacher Research

10.9 Professional Organizations of Interest to Reading Researchers and Teachers[1]

American Association for Applied Linguistics (AAAL)
American Educational Research Association (AERA)
Association Internationale de Linguistique Appliquée (AILA)/International Association of Applied Linguistics
Australian Council of TESOL Associations
International Association of Teachers of English as a Foreign Language (IATEFL)
International Literacy Association (ILA, formerly the International Reading Association)
Japan Association of Language Teaching (JALT)
National Reading Conference (NRC)
Regional English Language Center (RELC) (Associated with the Southeast Asian Ministers of Education Organization, SEAMEO)
Teachers of English to Speakers of Other Languages (TESOL)

Note

1 Consult organizations' websites for affiliates.

Glossary

Note: Page number in parentheses after each term indicates the first major use of the term. Words in italics can be found elsewhere in the glossary.

action research (p. 200) Type of teacher-initiated research in which teachers look critically and systematically at their own classrooms for the purposes of improving their own teaching and enhancing the quality of learning that takes place.

analysis of word parts (p. 216) Vocabulary-building activity in which students break down words into their smallest parts to identify prefixes, suffixes, and stems.

assessment *for* learning (p. 153) Learning-oriented assessment; feedback provided by the teacher supports learning and raises students' awareness of ways to improve learning.

associative learning (p. 14) Ability to associate one instance of input with another over time if they are encountered together many times (e.g., one word with another word). The associations may form *chunks* of information that become, in turn, larger units of meaning (e.g., bread and butter). Some associations become common relationships that activate faster recovery of related information (doctors, nurses, hospitals, illnesses, medical procedures).

automaticity (p. 17) Ability to carry out a skill accurately and rapidly, without being able to reflect on the processes involved and without being able to suppress the skill.

autoregressor (p. 77) A prior measure of the same ability that is the dependent variable in a *multiple regression analysis*. For example, in a components-of-reading-ability analysis among 5th graders, the researcher would first enter a 3rd grade reading measure of the students. In this case, the 3rd grade variable is the autoregressor. Other predictor variables, as part of the multiple regression analysis, must independently account for additional variance in 5th grade reading after all the variance accounted for by 3rd grade reading is removed.

background knowledge (p. 7) Prior knowledge that readers utilize in interpreting a text. This includes general, cultural, and topic-specific knowledge.

bottom-up models of reading (p. 29) Metaphorical depiction of reading as a mechanical process in which the reader creates a unit-by-unit mental translation of the information in the text, with little interference from the reader's own background knowledge.

bridging inferences (p. 31) Inferences that are minimal in nature and simply provide links between new information being processed and existing information in the growing text model. Links can emerge from overlapping items that involve repeated forms, repeated meanings, part-whole relations, set–member relations, etc. Bridging inferences are implicitly activated and automatic (cf. *elaborative inferences*, *inferencing*).

central executive processing (p. 24) Operation of working memory that, for example, focuses attention selectively, attends to priority tasks, allocates task operations strategically, sets goals for reading, monitors comprehension, and repairs comprehension problems. It covers several underlying general cognitive processes and may now be seen as more than, or different from, a component of working memory.

chunking (p. 14) Outcome of *associative learning* when two meaningful units co-occur often in the input and take on a consistent structural pattern as a single unit of meaning on its own. It is a one form of *implicit learning*.

CLIL (p. 167) See *Content and Language Integrated Learning*.

cognates (p. 43) Words, related in origin, with similar forms and meanings in another language.

collocations (p. 171) Words that combine with one another regularly (e.g., operating room, consumer spending, vanilla ice cream).

component skills (p. 18) Variables that are believed to be contributors to the development of reading abilities. Linguistic component skills and knowledge bases include phonological awareness, word recognition, morphology, vocabulary, and syntax. Non-linguistic variables might include motivation, working memory, statistical learning, among others. Component skills are all the skills that are attributed to the individual learner (as opposed to socioeconomic status of family).

comprehension monitoring (p. 9) Ability to keep track of one's comprehension and recognize when one is no longer comprehending. Monitoring, more generally, is an underlying cognitive ability used for all of our cognitive functions.

confirmatory factor analysis (p. 88) A special type of factor analysis. It tests whether measures of a construct or factor (the data) fit a hypothesized model. In this way, the researchers are looking for confirmation of prior research or theory.

connectionist theories (p. 79) Theories of how cognitive processes work, reflecting likely psychological correlates to the brain's neurological structure. In their most current versions, they provide strong accounts for word-recognition processes, vocabulary knowledge and learning, and the development of syntactic knowledge (see Schwanenflugel & Knapp, 2016, for an introduction).

Construction-Integration Model (C-I) (p. 30) A ground-breaking theory of reading comprehension that broke away from top-down orientations to reading. It represents an effort to integrate automatic processing of text with a strong inferencing model to form a situation model of reading. This model is currently influential in reading research.

Content and Language Integrated Learning (CLIL) (p. 167) An instructional approach, which originated in Europe, that makes a dual commitment to language and content learning. In CLIL classrooms, a second or additional language is used for the learning and teaching of both content and language. The approach emerged as a response to Europe's goal to promote multilingualism and plurilingualism (cf. *content-based instruction*; see also Dalton-Puffer, 2017).

content-based instruction (CBI) (p. 142) Overarching term referring to instructional approaches that make a dual, though not necessarily equal, commitment to language- and content-learning objectives. (See also Concept 5.1.)

control group (p. 84) A group (of students)—used as a standard of comparison in a controlled experiment—that does not receive the *treatment* that the researcher is interested in. A group that, ideally, differs from the *experimental group* only in terms of the single factor that the researcher is investigating.

correlation (p. 74) The extent to which two or more things are related; measure of the strength of the relationship between two sets of data. For example, as vocabulary knowledge increases so does reading comprehension ability. Correlations are reported on a scale from –1.00 to .00 to 1.00 and the actual number is a correlation coefficient. There are multiple correlation formulas; the most common one is Pearson correlation. A correlation indicates a *potential relationship*, but it does not indicate that one variable *caused* the occurrence of the other. (See also Concept 3.2.)

correlation coefficient (p. 75) See *correlation*.

deliberate practice (p. 140) Purposeful, goal directed, communicative, staged, and sequenced activities that lead to the development of expertise (Ericsson, 2009; Ericsson & Pool, 2016). Deliberate practice entails well-defined goals (broken down into sub-goals and sub-routines) for improving select aspects of the target performance (reading, for the purposes of this discussion). Necessitates learners' full attention, concentration, and modification of effort in response to teacher-as-coach feedback.

discourse organization (p. 37) Structural framework of discourse. Patterns and features of discourse that reflect *genre*, writers' intentions, flow of information, *text structure*, and types of information being presented. (For us, discourse organization is a more general term than genre, *rhetorical organization*, and text structure.)

discourse structure (p. 41) See *discourse organization*, *text structure*.

discourse structure awareness (p. 118) See *text structure awareness*.

discourse structure graphic organizer (DSGO) (p. 119) An instructional tool that clearly displays text-specific organizational patterns (e.g., cause–effect,

chronology, problem–solution), raises students' *discourse structure awareness*, and aids with text comprehension. (See Appendix 8-A for sample DSGOs; cf. *graphic organizer*.)

effect size (p. 94) Effect size is a statistical concept that quantifies the size of the difference between an experimental group and a control group (or the effect of post-treatment measures versus pre-treatment measures). Effect size is a statistic that is a meaningful interpretation of the importance of the difference between the *experimental group* and *control group*. (See also Concept 3.6.)

elaborative inferences (p. 32) Inferences that are not required for comprehension to proceed. They provide additional information to the situation model beyond what is in the text. These inferences require more deliberate connections between incoming information and background knowledge to create information that is not stated in the text. Some researchers argue that these inferences sometimes occur as automatic passively formed links that do not need cognitive attention (like *bridging inferences*), but evidence for this view is limited. It is not clear that these inferences are regularly generated during reading but may be generated after reading and on further reflection.

engagement (as motivation) (p. 83) Engagement is represented by actions to carry out reading goals and beliefs in response to positive motivations to read. Engagement represents the *doing* part of reading.

episodic buffer (p. 26) The part of Alan Baddeley's theory of working memory during which an integrated unit may remain active for a short period of time, being reactivated with each new instance of input into the unit. This is one way to think of how a text model remains active as it is being built from reading input and linguistic processing (cf. *long-term working memory* as an alternative way to understand how a text model can remain active).

experimental group (p. 83) The group receiving special experimental training. Also called a *treatment group*.

exposure to print (p. 18) A term for cumulative amounts of reading done by learners over a long period of time. Also referred to as print exposure and amount of reading (cf. *extensive reading*).

extensive reading (p. 76) Approach to the teaching and learning of reading in which learners read large quantities of material that are within their linguistic competence. Also refers to reading large amounts of text material.

factor analysis (p. 90) Factor analysis, a statistical procedure, is most commonly exploratory. It investigates variable relationships by collapsing a large number of variables into a few interpretable underlying factors. Factor analysis, in this form, is a process of data reduction to a small set of more reliable variables.

fluency (p. 37) Fluency in reading involves a combination of speed, accuracy, and fluidity of processing. It is a relative concept that must take into consideration reading task, reading topic, reader's age, and amount of L2 exposure.

forward-looking feedback (p. 153) A term used by Carless (2007) that refers to feedback that (a) raises students' awareness of learning progress, (b) leads

to classroom discussions and student self-reflection to improve learning outcomes, (c) facilitates teacher–student and student–student interactions centered on ways to improve performance, and (d) results in active student engagement with feedback to improve their (reading) abilities.

genre (p. 24) Means for organizing formal aspects of a text to reflect specific functional intentions of a group, discipline, or culture. Genres (e.g., poetry, mysteries, letters of recommendation, academic journal articles, sermons) have specific aims, expectations, and defining characteristics.

graded readers (p. 150) A series of books, usually for L2 students, ranked by vocabulary level, grammar structures, or another level of difficulty rather than by grade level. Students who are learning to read or learning a language read them. The students gradually work through the series as they become ready for more challenging vocabulary, grammar, length, and so forth.

graphic organizer (p. 145) Visual display (e.g., pie chart, timeline, Venn diagram) used to represent and organize textual information (cf. *discourse structure graphic organizer*).

implicit learning (p. 14) Learning that is not a focus of explicit attention and that emerges over time as tacit knowledge. At a simple level, it is unconscious learning based on exposure to input and internalized through *statistical learning* and *associative learning*.

incidental learning (p. 108) Learning that occurs without focusing on specific information. It may or may not require some level of conscious attention. In discussions of reading, readers read to understand the text, not to learn the words in the text. Nonetheless, readers notice and attend to words as they move through texts, even if only for very short periods of time. Some of these words are learned through incidental learning.

inferencing (p. 9) Ability to draw a logical conclusion based on explicit information in a text and with a connection to *background knowledge* (cf. *bridging inferences*, *elaborative inferences*, *paraphrasing connections*).

informed consent (p. 212) Agreement by individuals to participate in a research or action research project. It assumes that the participant understands the nature of the study, its implications, and future consequences. Informed consent is typically obtained before the beginning of a research study.

Institutional Review Board (IRB) (p. 211) A committee—at, for example, a school, university, or language program—formally charged with ensuring that research is conducted ethically. The committee is responsible for approving and monitoring research with the aim of protecting participants. Sometimes an IRB is referred to as an Ethical Review Board.

IRB (p. 211) See *Institutional Review Board*.

jigsaw reading (p. 168) Instructional technique in which subgroups of learners in a class are asked to read different parts of a text (or different texts). The full picture is then pieced together, like a jigsaw, when members of different groups come together to complete a task.

Landscape Model of Reading (p. 32) An influential model of reading that is similar to the *Construction-Integration Model*. It is based on the incremental

development of a text model clause by clause and incorporates inferencing processes to build a situation model.

Language Threshold Hypothesis (p. 47) General level of second language reading ability that allows a reader to understand a text fluently according to the reader's purpose. Above the threshold, a reader is able to call on strategic reading processes (from both first and second language) effectively. The threshold varies with specific tasks, topics, and reader purposes, but at some point, with continuous practice in reading, the reader is able to read most texts at a level above the language threshold. (See also Concept 2.3.)

latent composite score (p. 126) A *latent variable* created from a set of related raw score measures (e.g., three specific but somewhat different vocabulary measures).

latent factor (p. 90) Latent factors are the result of a *factor analysis*. Latent factors are not directly observed. Instead, they are inferred using models from observed data.

latent variable (p. 126) The interpretation of the output of a *latent composite score* to create a named variable.

learning-oriented assessment (p. 153) See *assessment for learning*.

letter–sound correspondences (p. 16) How well a given letter corresponds with its phonemic variants and a given sound with its orthographic variants. Note that a sound may have more than one spelling (/f/→f, ff, gh), and a spelling may have more than one sound (a→/a/ as in *have*, /ae/ as in *mad*, /e/ as in *made*).

lexical access (p. 16) Rapid and automatic activation of word meanings in the lexicon. It is possible in second language contexts to recognize a word (word-form recognition) but not have any useful meaning entry for that word stored in the lexicon.

Lexical Quality Hypothesis (p. 68) Lexical quality refers to very high-quality representations of three fully specified lexical constituents: the orthographic, phonological, and semantic specifications of the word. The orthographic representations are precise. The phonological representations, linked to orthographic representations, emerge through explicit teaching and reading experiences. The semantic representations include many rich associations to other word meanings and a high level of integration with the reader's background knowledge.

lexical sets (p. 216) Sets of words that have semantic or grammatical similarities (e.g., words for food, classroom terms, words related to botany, words for hedging, nouns, transition words, adverbs).

longitudinal study (p. 76) Research that involves the study of the same learners over a period of time, usually for at least five to six months but often longer, sometimes up to several years.

long-term memory (p. 12) Technical term for *background knowledge*. (See also Concept 1.3.) It includes all the knowledge we have of the world, our experiences, our learning in specific disciplines, our lexicon, our tacit (implicit) knowledge, and our internalized procedures and habits that we have in navigating our world.

long-term working memory (p. 26) A concept developed by Ericsson and Kintsch (1995) to account for the rapid call-up of information that is primed in some way and is brought into active working memory much more quickly than might otherwise be expected. Long-term working memory refers to material that is partially active because of linkages with currently active information (cf. *episodic buffer*).

meta-analysis (p. 74) Advanced statistical technique that merges the results of individual research studies on the same topic. It usually requires that studies include certain statistics (means and standard deviations), use an experimental design (experimental and control groups, pre-test and post-test), and report appropriate reliability statistics. The purpose of a meta-analysis is to determine the overall effect on the targeted variable (e.g., reading comprehension) on the basis of the pooled data to increase statistical power. The result is an overall effect-size statistic for the specific question. (For example, in Cohen's *d*, an effect size of .20 is small; .50 is moderate, .80 or bigger is large.) (See also Concept 3.1.)

metacognitive awareness (p. 41) See *metacognitive knowledge*. Some researchers distinguish the two terms, but many others do not. We do not make a distinction in this volume.

metacognitive knowledge (p. 42) Conscious awareness of one's knowledge—More specifically, the ability to reflect on what one knows (e.g., goals, procedures, strategies, background knowledge). Such knowledge allows a reader to plan, regulate, and monitor learning and (in the context of this book) reading. Also sometimes referred to as metacognitive awareness. (See also Concept 2.1.)

metalinguistic awareness (p. 41) See *metalinguistic knowledge*.

metalinguistic knowledge (p. 42) Conscious awareness of language that allows one to recognize and discuss linguistic categories such as nouns, verbs, subordinate clauses, and word meanings. (See also Concept 2.1.)

models of reading (p. 29) Theories of the component skills, processes, and knowledge bases involved in reading. Formal models are based on the results of empirical evidence and are typically confirmed by additional independent studies. Descriptive models attempt to synthesize existing research comprehensively. Metaphorical models attempt to interpret more generally the reading processes involved in comprehension.

morphological awareness (p. 30) See *morphological knowledge*. Note that some researchers distinguish morphological awareness and morphological knowledge. In this volume, we do not make this distinction (cf. Levesque, Kieffer & Deacon, 2019).

morphological knowledge (p. 42) Knowledge of word prefixes, word suffixes, word stems, and word-formation processes (also referred to as *morphological awareness*).

morphology (p. 41) The study of minimal meaning units of a language, including word prefixes, word suffixes, word stems, and word-formation processes.

motivation for reading (p. 52) Motivation includes goals, values, beliefs, and

dispositions toward reading. Essentially motivation addresses the desire to read and achieve personal goals. (See *engagement as motivation*.)

multiple regression analysis (p. 77) A statistical technique for evaluating the relationships among variables—more specifically, a statistical technique for estimating or predicting the impact of two or more variables, independently, on a dependent variable. For example, multiple regression allows a researcher to remove the influence of other variables (e.g., vocabulary, background knowledge, grammar) on a dependent variable (reading comprehension ability) and then see if the skill one is interested in (e.g., oral passage fluency) still has an independent significant effect on the dependent variable (reading comprehension).

multiple regression model (p. 77) See *multiple regression analysis*.

non-linear text (p. 151) Text that is not organized by sequences of sentences and paragraphs. Examples of non-linear text include charts, diagrams, figures, graphs, maps, and tables. Non-linear digital texts include hyperlinks to additional information.

Orthographic Depth Hypothesis (p. 43) Orthographies around the world vary from being more transparent (letters and sounds have a one-to-one relationship) to more opaque (many exceptions to letter–sound relationships), to most opaque (non-alphabetic languages like Chinese, in which relationships between forms and sounds are very opaque). (See also Concept 2.2.)

orthographic knowledge (p. 16) Knowledge of graphic representations of a written language; these graphic representations may be alphabetic, syllabic, or morpho-graphic in nature.

orthography (p. 43) The graphic forms of language.

paced reading (p. 178) Rate-development activity during which students read at a fixed rate determined by the teacher (e.g., 100 words per minute). In an ideal paced-reading program, students read at a rate that is challenging but not overly frustrating and that gets progressively faster over time.

paired readings (p. 178) Activity in which students work in pairs on a variety of reading tasks. One possibility is for students to take turns reading segments of the text aloud to each other, with the "listener" monitoring and helping out with reading problems.

paraphrasing linkages (p. 22) Semantic associations with one or more words that are currently active in text model construction. The connections are automatically activated when fluent readers have dense networks of semantic associations in their lexicon. This process is a major mechanism for developing word-to-text integration (Perfetti and colleagues) without requiring a formal theory of inferencing.

parsing (p. 19) Act of breaking clauses down into their smaller constituent units. See *syntactic parsing*.

path coefficients (p. 80) Path coefficients can be understood as similar to, but not the same as, *regression coefficients*. They are standardized regression coefficients that take into account multiple other coefficients in *structural equation modeling* (SEM).

phonological awareness (p. 16) General ability of learners to recognize phonemic sounds in a word, syllables in a word, or syllable parts within a syllable.

previewing (p. 178) A common pre-reading strategy that entails looking over the text that is going to be read to identify its key features, ascertain the way(s) the information is organized, make predictions, and establish expectations about information in the text.

print exposure (p. 75) See *exposure to print*.

pseudo words (p. 110) Non-words that are pronounceable in the target language but do not actually exist as a word. Pseudo-word identification tasks assess the ability to (a) look at a non-word (e.g., spind, morkind) and pronounce it using the phonological rules of the language or (b) see a pronounceable non-word and press a button (e.g., on a computer) indicating that the form is a non-word (i.e., a lexical decision task).

qualitative data (p. 207) Data relating to or concerning some quality (cf. *quantitative data*).

quantitative data (p. 207) Data that can be counted, measured, expressed as a quantity (cf. *qualitative data*).

Rasch analysis (p. 126) A statistical tool that provides ways to standardize data so that the resulting variables are more reliable and comparable.

Readers Theater (p. 175) The performance of a reading in which the focus is the dramatic interpretation of a text. Performers stand in front of the class holding their scripts and reading the story aloud, interpreting their parts using stress and intonation. Advocates of Readers Theater urge teachers to use it for reading fluency training in large part because of the important role that re-reading and appropriate phrasings play in preparation.

reading guide (p. 183) A teacher-created handout, distributed to students before a reading assignment, that "walks" students through a reading passage, modeling the steps taken and the strategies used to comprehend the passage. It typically includes pre-reading, during-reading, and post-reading tasks. All tasks are tailored to the assigned passage. (See Appendix 6-C for a sample reading guide.)

reading processes (p. 11) Cognitive activity involving skills, strategies, attentional resources, knowledge resources, and their integration. Cognitive operations that occur in *working memory* and that draw upon *long-term memory*.

Reading Systems Framework approach (p. 34) This approach to explain reading comprehension outlines the likely comprehension process from visual input of print forms of words in a text all the way to the situation model that interacts strongly with a reader's general knowledge. The approach recognizes the strong role of word recognition, lexical access, and word-to-text integration as the processes leading to text representation and situation model formation.

reading to integrate information (p. 9) A purpose for reading that requires the same detailed level of comprehension as *reading to learn*; it also requires decisions about the relative importance of select information and possibly the rhetorical reorganization of information from multiple sources. The critical

evaluation of information being read is required so that the reader can decide what and how information is to be integrated.

reading to learn (p. 8) A purpose for reading. Reading-to-learn tasks are typical of academic and professional settings where readers need to learn information (i.e., main ideas as well as details that elaborate the main ideas) from the text and link the text to their own knowledge bases.

reading to search (p. 8) A purpose for reading in which readers combine scanning for a word or phrase with minimal sampling of sentence meaning to determine if they are in the right areas of the text for targeted information.

reciprocal teaching (p. 96) An instructional approach in which students are trained to skillfully use four strategies to achieve text comprehension: predicting, questioning, clarifying, and summarizing. Students work in small groups and take turns modeling for their peers how to apply the four strategies for text comprehension (thus, the "reciprocal" designation) while discussing the contents of the text that they are reading.

regression coefficient (p. 80) A statistic that is somewhat like a *correlation coefficient*, but it is predicting the relation of one variable to a second variable. A correlation coefficient is simply indicating that two variables have a relational strength.

repeated reading (p. 178) Instructional fluency task that engages students in reading a short passage repeatedly (unassisted or assisted) until they achieve a preset reading rate and comprehension goal (cf. *re-reading*).

re-reading (p. 161) Instructional activity in which students re-read the same passage or text for a new purpose. Re-reading may involve a search for new information, an effort to repair comprehension, the completion of a post-reading activity, among other purposes. Also a common reading strategy to repair faulty comprehension.

rhetorical frame (p. 8) The patterns of organization that writers use to present primarily expository information and that readers construct mentally to learn relevant information. Possible frames include cause–effect relations, classification, comparison and contrast, linear sequences, and problem–solution relations (cf. *rhetorical organization*, *text structure*, *discourse structure*).

rhetorical organization (p. 94) Pattern of organization used primarily in expository and persuasive texts where information is presented as analysis, cause and effect, classification, comparison and contrast, definition, description, problem–solution, a timeline, or process. Narrative texts can also be analyzed in line with these patterns of rhetorical organization.

scaffolded instruction (p. 160) See *scaffolding*.

Scaffolded Silent Reading (ScSR) (p. 160) Approach to reading instruction that makes use of silent reading practice with level-appropriate texts, coupled with teacher guidance, periodic teacher monitoring of and interaction with individual students, and accountability measures (cf. *Sustained Silent Reading*).

scaffolding (p. 167) An instructional strategy that involves supporting novice learners to facilitate learning; the concept originates from Vygotsky's

sociocultural theory and his concept of the "zone of proximal development." As learners gain knowledge, skills, and confidence, support (scaffolding) is removed (and possibly replaced by other forms of support to complement new learner needs).

scan (p. 8) Specialized type of reading in which the reader searches quickly for a specific piece of information or a specific word (cf. *skim*).

SEM (p. 80) See *structural equation modeling*.

semantic feature analysis (p. 216) A vocabulary-learning method that requires students to relate terms associated with a topic or some concept. For example, students could be asked to categorize various energy terms (e.g., thermal energy, nuclear energy, hydroelectric energy, solar energy, wind) according to whether the terms have certain properties (e.g., organic, natural, polluting, non-polluting).

semantic proposition formation (p. 19) Process of combining word meanings and structural information into basic phrase-level and clause-level meaning units. (See Concept 1.6 for an illustration.)

shared variance (p. 78) A statistic for the amount of overlap between two measures (expressed as a percentage), based on the statistical variation that is shared between the two measures. It translates a Pearson correlation (square the Pearson correlation) into a numerical variable that provides a more interpretable approximation of the relation between the two variables. For example, if the shared variance between a vocabulary score and a reading comprehension score is $r^2 = .55$, then 55% of how the students' scores varied in their responses to the vocabulary test overlapped with how they responded to the reading test. (See also Concept 3.3.)

Simple View of Reading (SVR) (p. 29) A theory of reading comprehension based on the idea that reading comprehension is some combination of word-recognition knowledge and listening (or oral language) comprehension knowledge. It is widely cited and investigated.

situation model of reader interpretation (p. 23) Reader's elaborated interpretation of information from the text in terms of his or her own goals, expectations, feelings, and *background knowledge*. The situational model reflects what the reader stores away as learned information from reading.

skills (p. 10) Linguistic processing abilities that are relatively automatic in their use and their combinations (e.g., *lexical access*, *semantic proposition formation*, slower reading rate with different texts).

skim (p. 8) Specialized type of reading in which the reader reads quickly for a general understanding of the text, for the gist of a passage. The process typically involves the strategic skipping of segments of the text and the reading of key parts (cf. *scan*).

SSR (p. 196) See *sustained silent reading*.

standard of coherence (p. 32) Reading goal set by individual readers that determines how intensely they are willing to read to extract ideas and information from the text successfully (to meet their goals). Readers set higher or lower standards of coherence depending on task or student *engagement*.

statistical learning (p. 14) Our abilities to draw statistical probabilities from extensive amounts of input over time.

strategies (p. 10) Abilities that are potentially open to conscious reflection and use (e.g., establishing a purpose for reading, previewing a text, taking steps to repair faulty comprehension). See Appendix 5-B for a list of common reading strategies.

structural equation modeling (SEM) (p. 80) A statistical technique used to show the impact of certain variables while, at the same time, eliminating the impact of several other variables; a statistical technique that shows the strength and nature of hypothesized relationships among sets of variables. It is an advanced procedure that relates multiple variables and shows their relationships independently of all the other variables. The procedure also accounts for error variance, so the relationships identified are more likely to be true relationships. (See also Concept 3.4.)

Sustained Silent Reading (SSR) (p. 160) Classroom time devoted to silent reading, when teacher and students are reading materials of their own choice. Typically SSR sessions occur on a regular basis, without instruction, evaluation, or interruptions. Also referred to as DEAR: Drop Everything And Read. (cf. *Scaffolded Silent Reading*)

syntactic knowledge (p. 85) Knowledge of phrase-, clause-, and sentence-level structures (sometimes referred to as grammatical knowledge).

syntactic parsing (p. 18) Reader's ability to process words as larger units of structure (phrases and clauses) so that basic grammatical information can be extracted to support clause-level meaning formation.

text model of reading comprehension (p. 30) In the *Construction-Integration (C-I) Model*, the text model of reading comprehension refers to higher-level comprehension processes involving the integration of new information with information from prior text. The C-I model makes certain assumptions that other theories of reading comprehension do not make.

text representation (p. 23) Reader's emerging understanding of a text based on the integration of new semantic propositions into the existing proposition network of ideas from the text. The text representation generates the main ideas, supporting ideas, and relevant details intended by the author. It is a mental summary of what the author means to say. Unlike the *text model of reading comprehension*, the text representation incorporates *background knowledge* and *bridging inferences* (cf. *semantic proposition formation*).

text structure (p. 37) Language features that mark text information and writers' intentions (e.g., new versus given information, paragraphing, sequence markers, signaled rhetorical patterns, transition phrases and sentences). It is also viewed more narrowly as patterns of organization primarily used in informational texts (e.g., cause–effect, problem–solution). (See also *discourse structure*.)

text structure awareness (p. 118) Conscious awareness of the ways text information is organized and the signals that provide cues to this organization.

Good readers use text structure awareness for reading comprehension. (See *discourse structure awareness;* see also Concept 5.3.)

think alouds (p. 163) Teaching technique during which the teacher models strategic reading behaviors while reading aloud to students. The teacher uses a think-aloud script, written before class, to verbalize targeted reading behavior. (See Table 9.2 for a sample think-aloud script and an itemization of the reading strategies being modeled.)

timed reading (p. 178) Rate-development activity during which students time their reading (in words per minute) and calculate comprehension scores. The goal is to improve reading rate and comprehension over time.

top-down models of reading (p. 29) Metaphorical depiction of reading that characterizes the reader as someone who has a set of expectations about text information, directs the eyes where to look on the page, and samples enough information from the text to confirm or reject the hypothesized expectations. This is an extreme interpretation of reading processing that is no longer accepted by reading researchers.

training study (p. 82) Research that involves training a group of participants in some skill or set of tasks. The group in the training study is the *treatment group*.

transfer (p. 38) Use of L1 knowledge (e.g., phonological, syntactic, strategic) in L2 tasks. (See also Concept 2.4.)

treatment (p. 85) The training, instruction, or resources that are given to an experimental group but not to a *control group*.

treatment group (p. 95) The group that undergoes the *treatment*. See *experimental group*.

underlying general cognitive processes (p. 14) General cognitive abilities that underlie the development of all learning and cognitive functions, including fluent reading. (See Concept 1.4 for a listing of underlying general cognitive abilities.)

word-to-text integration (p. 15) Word-to-text integration involves explicit identification of the roles of *lexical access*, *syntactic parsing*, semantic propositional formation, and *paraphrasing linkages* as foundational input for building the *text representation* and *situation model of reading*.

working memory (p. 12) Active component of memory processes in cognition. It is limited in capacity, retains active information for a relatively short period of time, and integrates information and processes to construct comprehension. It is not a separate part of brain functioning but is a network of currently active information and related processes being used at a given moment. (See also Concept 1.3.)

working memory activation (p. 26) Process in which information that is sufficiently excited (electrically and chemically in the brain) becomes part of the working network of information being used actively in cognitive processing.

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